
MEDICAL REPOSITORY,

FOR

FEBRUARY, MARCH, AND APRIL, 1805.

ARTICLE I.

HISTORY of the EPIDEMIC DISEASE which prevailed in Adams County (Pennsylvania), in the Summer and Autumn of 1804: Communicated by SAMUEL AGNEW, M. D. of Gettysburgh, in the said County.

I PROPOSE, in my present communication, to give you a history of an epidemic which prevailed in our country during the last summer and autumn. And, I may observe, that this country was never, since its first settlement, visited by so generally prevailing a disease.

It may be proper that I should precede this account with a brief statement of the weather. This I shall do from recollection, and some notes which I occasionally made from the 1st. of July, through the summer and autumn. This statement must necessarily be defective, as I had no instruments to determine the temperature, or other states of the atmosphere; but was guided by the impression made on my different senses.

The spring was unusually cold throughout all its months. A great quantity of rain fell, scarcely two days together which did not visit us with showers. The farmers were prevented from putting in their spring crops until after the usual season a considerable time. The same degree of coldness proportionally continued through the month of June. Double the quantity of rain fell during the spring and this month, that perhaps ever was known to fall in this country in the same time. In a great many instances the farmers did not begin plowing their corn until after harvest, or until a much later period than usual. The latter end of June is the season for cutting grass, which is cured before harvest, particularly with those that mow clover. Those who attempted this season to mow, almost universally lost their grass and clover. In many instances whole meadows were de-

stroyed, where they lay low, and on the banks of large waters: the streams were all over their banks a much greater distance than usual. Vegetation, especially of the natural or indigenous plants, was remarkably rapid; but of those that are cultivated, it was extremely backward, except the esculent roots. Winds were almost steadily from the S. and E.

About the middle of the first week of July, the weather began to assume the complexion of the season. The wind veered about for the most part to the W. and N. W. From this time to the 19th, the weather was warm, with frequent showers. From this to the 26th, it was disagreeably cold, so as to oblige people to wear thick clothing. Fires were comfortable in the evening, nights foggy, dews heavy, and the days smoaky, very much resembling what is called Indian summer. From the 26th of July to the 6th of August, the weather was sultry, dry and clear, ground very hard, roads dusty, vegetation suffering much, wind from the W. and N. W. On the night of the 5th of August, a rain commenced, which continued, with short intervals, to the 9th. Waters high, ground very wet, wind from the E. Warm and clear from the 9th to the 13th, when we had frequent showers. Wind from the N. E. From the 14th to the 26th, the weather was very sultry, though mostly cloudy, with S. and E. winds. Indeed, from the 22d to the 30th, it was continually clouded, with frequent drizzling rains, also very cool for three or four days preceding the 30th. Very sultry from this to the 3d of September, when a tremendous thunder storm took place in the afternoon, accompanied with violent wind and heavy rain. The weather much moderated after the storm. Continued moderately cool, with but few rains, to the 9th of October. On the morning of the 30th ult. there was a considerable quantity of hail and snow fell, with rain. Wind from the N. W. nights cold, with frost. On the morning of the 9th of October, about day-light, the heavens appeared darkened to the W. and N. W. which increased with heavy thunder and lightning, accompanied with violent wind and rain, and in some places hail; it continued from twenty to thirty minutes. The day throughout was exceedingly stormy and cold, with occasional rains. The succeeding day also very windy and cold. The wind on both days from the W. and N. W. The weather from this to the end of the month was such as we generally have at that season, the nights frosty, winds high and cold, with some genial suns in the middle of the day. This ends the history of the weather.

There will be nothing remarkable to relate respecting the

diseases of the spring or the month of June, and part of July. The spring was remarkably healthy. During the month of June and first part of July, the whooping-cough, and some other slightly inflammatory diseases, rheumatism, catarrh, &c. had a partial prevalence. On the 3d of July I was applied to, for the first time, for an emetic, to a patient under the intermittent. On the 13th I was called to see a gentleman attacked with the cholera morbus. This, by the use of diluents and anodyne draughts, was soon relieved. I was applied to on the 18th again, for a young girl about three years of age. She complained two days before of pains through the muscles of her back, her extremities, and in her head, chilliness and lassitude. She is attacked with the same symptoms to-day, though more aggravated. I directed an emetic of antimon. tartar. and the use of the bark afterwards. I understood shortly after that she became better. It may be proper to remark here, that this family lives at a grist mill, about two miles from this place. The dam is within twenty or thirty rods of the house. The water holds suspended a large quantity of clay, covers a large flat of marshy ground, overgrown with weeds, and at this season the water subsides, and leaves a large portion of ground exposed to the burning rays of the sun. This must necessarily contaminate a large portion of atmosphere with deleterious gases: and the degree of sickness which prevailed in this family confirms the fact; for not an individual belonging to the house, which contained two families, but was attacked with the intermittent; and even the friends of the proprietor, who came to visit him, were all the subjects of the same complaint.

On the 13th of July I was applied to for medicines for a young man, who was attacked with a violent inflammation of the liver. By frequent venesection, general evacuations, and local applications, as epispastics, with the impregnation of mercury, he was finally relieved by a recession of the inflammation.

The number of intermittents increased daily. Generally the first applications were from persons in the vicinity of waters or flat grounds. On the 22d I was called to see a widow woman about five miles from town. She awoke on the morning of the 20th with a violent pain in her head, some chilliness, with frequent flushes of heat, nausea, unpleasant taste in her mouth, and a general lassitude. She became better in the evening, and continued so till yesterday evening, when she was attacked with these symptoms in a more distressing degree;

especially her head was severely racked with pain, the light proving oppressive to vision. She continues in the same state this morning. She had a daughter about eight years of age attacked in a similar manner at the same time. This woman's family consisted of six persons, herself included, who were all attacked except one (who was likewise afterwards) in the course of a few days. Four of them had the *bilious remittent*, and the other the *intermittent*. It may be observed here, that there was a large plat of meadow covered with water, in consequence of a stone bridge being formed over the flat below, and daily subsiding, by the exhalations of a warm sun, within forty rods of the house to the N. W. This probably may have been the cause of so universal and so early an attack in this family. On the 25th I was called to see a young gentleman, aged about twenty-seven years, in the country. He complained of excessive pain in the head, nape of the neck, and small of the back, light painful to the eyes, skin hot and dry, face suffused, pulse full, tense, and frequent. On the 28th called to see a man aged thirty-five years. He had complained two or three days of pains in his muscles, a head-ach, and listlessness. Last evening he was attacked with a chill, succeeded by a violent head-ach, pain in the lumbar region, nausea, thirst, and aversion to light. This patient was of a phlegmatic habit, with lax fibre, much afflicted with eructation of wind, and depression of spirits during his illness, which continued about eight days, when he was able to leave his bed. From this time to the month of August, the applications for febrile patients were frequent, especially for the *intermittent*. And towards the end of this month and beginning of September, the fever became completely epidemic, carrying distress into every family almost without exception. About the first of September, the *intermittent* began to yield to the domineering influence of the *bilious remittent*.* The former became more continued in its complexion, approximating especially on the first days to the more malignant features of its elder sister. In many cases there were but very short intermissions, the cold fits very irregular, and scarcely perceptible; while the hot stage

* I am dissatisfied with this customary title of an autumnal fever; because it gives not only an imperfect idea, but an erroneous impression of its nature. For I think the *bile* has very little to do in promoting the disease; and, at the commencement, we very seldom find a *remission*. Dr. Miller has proposed an amendment for febrile nomenclature; and as expressive of a genus it may be appropriate, but we are still defective in terms for the different grades or forms of the Koino-miasmatic fever.

would continue, with very little abatement, for several days. By pursuing the depleting system at proper times, they would be brought to the *shaking form*.

On the 6th of September I observe I made the following note: "Fevers have been more frequent during and since the warm weather at the beginning of the month. The remittent form, with the continued in some instances, is more aggravated and frequent. I have had, since the 22d of July, nine cases of the bilious remittent, and forty-eight of the intermittent." Comparing this estimate with the succeeding cases, gives a striking evidence of the increased malignity of the epidemic. During the prevalence of our unhealthy season, I administered to one hundred and fifty or more, the third of which were of the remittent form. The month of September was the period in which the epidemic had its greatest dominion. Although there are three of us who profess the healing art in this place, and numbers through the country, yet we were all busily employed, and could scarcely attend to the demands for five or six weeks, commencing with the latter end of August. The complexion which this fever assumed, was of the same nature with those cases related above. The premonitory symptoms were a general lassitude, aversion to exercise, and a dull pain in the head, or perhaps the small of the back, or the lower extremities. To these succeeded generally a rigour, alternate chills and flushes of heat, violent pain in the head, nape of the neck, small of the back, loss of appetite, nausea, thirst, dry hot skin, oppression of the præcordia, hurried respiration, suffused face, vessels of the adnata turgid, light distressing, pulse hard, full, and frequent, and often the bowels constipated. There was some variation from these symptoms in several cases. Sometimes the head was nearly free of pain, and the back particularly suffered, and vice versa. In others the stomach and bowels were the seat of the greatest ravages. The former viscus was generally in the first stages much distressed with nausea, and aversion to all customary articles of food. In many cases the brain was primarily affected, producing delirium, especially during the paroxysm. In one case the pain appeared to be concentrated in the left great toe and foot, completely preventing their motion without excruciating pain. This patient was entirely free of pain in the head. In another case the action appeared to be directed to a deep seated muscle of the os femoris. In females there were almost uniformly some hysterical symptoms connected with the disease, such as great depression of spirits, flatulence, eructation of wind, suffocation

from lying in an horizontal position, a disposition to swooning, with very irritable stomachs. During the month of October, especially in the latter end, hæmorrhages were very frequent, particularly from the nose. These in many instances were profuse and alarming. In one case of a young man about twenty years of age, it was so alarming, that I was twice sent for to check it. However, I never felt much uneasiness at this circumstance, as I considered it rather a salutary evacuation, to relieve the vessels of the brain of turgescence and congestion. This symptom generally took place in an advanced stage of the complaint, and in habits of a lax fibre, and thin skin. On the 11th of October I find I made the following note: "No cases of fever since the 7th. within my knowledge. Old cases mending. We have good hopes of a cessation of the fever." You will find, by a recurrence to the history of the weather, that from the 30th of September, on which there was a considerable quantity of snow and hail, to the 9th of October, there were heavy frosts at night, and the days cool. On the 9th a violent thunder storm took place. From this date, the weather became more cold, and we found few, if any cases of fever after this time until the present period. But although the epidemic lost its dominion, yet it caused many to be its victims during the winter months. Those who neglected application at a proper time, or relinquished a perseverance in the use of suitable remedies, are now suffering for their folly. This is confined to the subjects of the intermittent. Numbers, from a prejudice against the bark, the common remedy, supposing it ineffectual, because by their negligence the disease would return, deserted every succour, and left themselves to try the effects of patience. But this cardinal virtue most generally failed in accomplishing their wishes.

It will now be necessary, after so full a detail of the symptoms and prevalence of the disease, to give a short portrait of the *method of cure*.

In the intermittent form, I generally directed the patient to be bled at least once during the height of the paroxysm. If it was an adult, I ordered 16 ounces. This almost uniformly gave immediate relief to the pain of the head, lessened the excessive action, relaxed the extremities of the capillary vessels, and brought on a perspiration earlier than otherwise would have been. After this I gave an emetic of antimon. tart. to produce a free evacuation of the stomach, and remove the crudities which incumbered it. This generally was a sufficient preparative for the bark, which was to be taken to the quantity of a tea spoon-

ful every hour during the intermission, if the stomach would retain it. If it refused the bark so frequently, the quantity was adapted to its capacity. This method rarely missed of effecting a cure in three or four days. If there was any other form which was more palatable, such as the decoction, tincture, or pills, it was so administered. Bark was frequently taken in whiskey, snake-root tea, or some other aromatic bitter, which generally answered every purpose. But the demand becoming so general, the inhabitants could not be supplied with bark for seven or eight days; the question was then, What would be the best substitute? Many used the dog-wood in powder and decoction. The last form was generally preferred, as being most readily prepared. This substitute answered the desired end when taken in large quantities. But it being more disagreeable than the cinchona, it was not often taken to that extent which was necessary. Many adopted the use of other vegetable bitters, as snake-root, tansy, rue, quaking ash, separately and combined; but these seldom answered the purpose. Reflecting that the salutary effects of the cinchona must depend principally upon its tonic and astringent powers, I was led to suppose that some of the mineral preparations might be substituted. I knew that arsenic would do; but from one trial I made of it in the form of pills, which, from hurry, were frequently not well compounded, I was discouraged from its use. It was now too late to prepare a solution which I attempted, but had no suitable method for its accomplishment; I therefore determined to try the acetite of lead. I prepared it in the form of pills, giving an adult one grain every two hours during the intermission. I administered it to three or four, on whom I considered it to have the effect of checking the paroxysm. But being more tedious in its operation, and I not altogether confident of its virtue, together with a supply of bark being received by the physicians and merchants in town, I was deterred from making any further trial. Indeed, at a time when there is a general prevalence of disease, the mind becomes alarmed and anxious, unwilling to wait the effects of an uncertain remedy, where a more convenient and certain one can be obtained. It is therefore an improper time for experiment, which requires leisure and perseverance. I also, in a few cases, prescribed a combination of a chalybeate preparation and alum, which I supposed, in two instances, to have a good effect; but I had not sufficient opportunities to enable me to give it a good name. However, I have little doubt but that many of the mineral preparations will answer the purpose in the intermittent.

The method that was generally pursued by me, in treating the varied forms of the *bilious remittent*, was, if called early, which was mostly the case, to take about 16 ounces of blood, give an emetic, or cathartic of jalap and calomel; the latter I mostly preferred. If the febrile action did not abate in 10 or 12 hours, I took more blood, administered the antimonial powder, gave cooling light drinks, as cold water, whey, apple-water, &c. strictly forbade the use of heating stimulant drinks; the room to be kept dark and well ventilated; the patient to be kept cool; an entire restriction of animal food, or any food whatever, if there was no inclination for it. I very frequently connected some of the carbonate of pot-ash with the emetic, and directed a solution to assist its operation, and often for a common drink. I uniformly found it have the most happy effects when there was excessive thirst, dryness of the fauces, nausea, and anxiety of the præcordia. Where a repetition of intestinal evacuants was necessary, I generally used some of the neutral salts, as the sulphate of soda, sulphate of magnesia, &c. Where the febrile action did not abate after one venesection, a cathartic, and some sudorific powders, I repeated phlebotomy, in some cases as often as six or seven times, and evacuated the bowels frequently and copiously. In the use of the lancet I was guided entirely by the pulse. While this continued hard, frequent, full, tense, or oppressed, I continued venesection. If there was much local action, or a concentration of excitement, I applied epispastics, especially if it was in the head; and after the excitement was reduced below the inflammatory point, I applied blisters to the fore-arm, ancles, and often sinapisms to the soles of the feet, to produce an abstraction, and excite a new disease. If there was apprehension of the complaint being obstinate, I uniformly impregnated the system with mercury; and when I got this accomplished, I considered my patient as secured from the ravages of the tyrant. This method, with a strict attention to cleanliness of person and room, procuring as much cool air as possible, restricting from the use of any thing stimulant, either as drink or food, and avoiding every circumstance which could disturb the mind, or excite vigorous action in the senses, proved, under my observation, the most successful in expelling the febrile poison from the system, and bringing it to that point which only required some attention to aliment or moderate tonics. Under this treatment I lost only three patients simply of the fever. Two of these were above fifty years of age, one a man, the other a woman. They were both attacked with the usual

symptoms of the epidemic. The man I considered much better after the third day from the time I saw him, but the fever directed its action upon the first passages, producing a hemorrhagy from the anus. The brain and nerves finally became affected, producing delirium, subsultus tendinum, and coma. The woman was so much relieved from a violent attack, that she was able to walk about for several days, but was obliged to distress herself by attendance on three daughters who were likewise confined. This produced a relapse, and by too much negligence, the disease became so fixed, that it resisted the most powerful remedies usually applied.

It may be expected that I should give some account of the origin or productive cause of this extensive pestilence. This I shall attempt in as brief a manner as possible, as this communication has been protracted beyond my expectations.

It is universally acknowledged by men of science and observation, that miasma, or noxious gases, arising from the putrefaction of vegetable and animal substances, are the cause of febrile disorder from the simple intermittent to the malignant plague. If, therefore, I can furnish materials for this process, I shall consider my object attained. It will be recollected in the history of the weather given above, it was stated that the spring months, and also that of June, were remarkably wet, more rain having fallen, double the quantity perhaps, than ever was known in the same period in this country. The banks of the rivulets and streams of our country were necessarily inundated; wet marshy grounds were entirely covered with water; vegetation was remarkably luxuriant in the natural grasses; the warm sultry rays of the sun acting on the vast quantities of alluvia on the banks of streams, and on the drowned suffocated vegetables of the marsh, during the months of July and August, must have produced a great decomposition of perishable matter. The extricated gas would be wafted into the air, visiting every habitable abode with the seeds of pestilence. The doctrine is confirmed by the fact, that families in the vicinity of low ground or flat waters, were generally first attacked, and most in number.

This disease, I am informed, proved much more mortal in some of the adjoining counties, as York, Cumberland, and Franklin. It may be a matter worthy the attention of the man of science to determine what were the causes which increased its malignity in those counties. I am induced to suppose that it may have arisen, in some degree, from the vast quantity of vegetable matter which was decomposed by the loss of large

crops of clover in these counties. These places are celebrated for raising large quantities of clover, and it was generally destroyed by the rains in the month of June. This circumstance, together with perhaps a number of low waters and flat grounds, and no doubt a constitutional predisposition of the atmosphere, were probably the remote causes of the increased virulence of the epidemic in those districts; but no doubt some of the gentlemen of the faculty in those counties will direct their attention to the developement of this mortal pestilence. I am informed that the febrile plague did not extend further south than about 150 miles from this place, which will be 36 deg. 30 m. N. longitude. I hope a spirit of investigation will prompt men of science, through different parts of Fredon, to determine the extent and remote causes of this destroying pestilence. I have an opinion that its extent will be limited by the dividing line between those places that were inundated with rain and those that were exempted.

ARTICLE II.

Some Particulars of a terrible HURRICANE which began to the Windward of the Caribbee Islands on the third of September, 1804, and proceeded North-westwardly over the Virgin Islands and Bahamas, on the fourth, fifth, and sixth, until it reached Florida, Georgia, and South-Carolina, on the seventh, eighth, and ninth; and of a furious GALE from the North-east which prevailed at the same time, and proceeded South-westwardly until it met the former: showing that Storms of the most destructive Violence sometimes arise to Windward, and bear down every Thing before them in their Passage to Leeward. From a Letter of Dr. MITCHILL to Baron HUMBOLDT, dated George-Town (Maryland), January 19, 1805.

MR. Volney, when he was in North-America, sought information concerning its atmosphere, with an intention of forming a theory of the winds prevalent in the territory of the United States. At that time I was not able to furnish any facts worthy to be communicated to that able observer. Since his return to Europe, I have had an excellent opportunity to collect the facts afforded by a most violent snow-storm from the north-east, on the 21st, 22d, and 23d days of February,

1802. These were published in the first Hexade, vol. v. p. 465, of the Medical Repository. From that inquiry it appeared that our most boisterous winter-storms, accompanied with snow and a north-east wind, began to leeward, and progressed to windward from South-Carolina to Maine, at the rate of about one hundred miles in an hour.

Since that collection of facts was printed, Mr. Volney has given to the public "his picture of the climate and soil of the United States," in two octavo volumes, at Paris, in 1803. In the ninth chapter of this work he has ventured to give "a system of the winds within the United States." Herein he has treated of the winds from the north, north-east, and east; from the south-east and south; from the south-west; and from the north-west, in distinct sections. But finding there are some considerations in my piece on the gale of February, 1802, which are not contained in his treatise upon our *north-east* wind, I take the present opportunity of inscribing it to you. In his short essay upon the *south-east wind*, he closes his observations for want of more facts, not choosing to supply their place by conjecture. I believe that by reason of a hurricane which lately happened in the southern latitudes, bordering on countries in North and South-America, which you have visited, it is now in my power to communicate to you some additional facts on the *south-east wind* of the western hemisphere, and some very important information relative to its *north-east* and *east* winds.

Between the 3d and 9th of September, 1804, there occurred in the Caribbee Islands, in the Bahamas, on the ocean to the north-east of these, and on the coasts of Florida, Georgia, and South-Carolina, one of the most destructive storms that had ever raged within the memory of man. The agitation of the atmosphere and of the sea was so dreadful as to overwhelm and destroy an uncommon number of vessels, cargoes and crews, both on the ocean and in port, and also to work great damage on shore. A current from the *south-east* swept all before it in its progress from the Caribbees. It had, however, various turnings, whirlings and eddies, blowing in the most opposite directions, and veering almost all round the compass. Another current from the *north-east* met the former in about the latitude of Charleston or Beaufort. The two streams formed for a while an *east* wind; which continued until the south-east gale triumphed by its superior force. This conflict of the winds was accompanied by torrents of rain, by a retardation of the Gulf-stream, and by such an accumulation of

water in the curvature of the coast between Florida and North-Carolina, as to lay a great portion of the low shores and islands of Georgia and South-Carolina under water. This storm, unlike the former one which I described, began to windward, and by violent propulsive force, worked its way to leeward. I have reduced to something like method, the relations and facts as stated by navigators, and gathered from cotemporaneous publications.

A gale or hurricane of this sort happened in September, 1782, as far north as lat. $42^{\circ} 15'$, and in long. $48^{\circ} 55'$. It began on the 16th, and destroyed many English ships, belonging to a fleet of ninety sail, then off the banks of Newfoundland, and bound homewards from Jamaica. It began at east-south-east on that day, and prevailed with greater violence than was ever before known on that part of the ocean, until about three o'clock the next morning, when, without the least warning, it shifted in an instant, and blew with such fury from the north-north-west, that the oldest seaman in the fleet had never seen the like. The *Ramillies*, the *Centaur*, *L'Hector*, the *Ville de Paris*, and many other ships, the spoils of Rodney's victory in the West-Indies, all perished.

The particular accounts will be given under distinct heads ; classing the occurrences according to their appearance.

1st. *In the Caribbee Islands.* On the 3d of September there was an hard gale at *Martinique*, so as to make vessels quit their anchors, drive ashore, &c. A number of vessels were driven ashore at *St. Croix*. Of thirty-two sail at *St. Bartholomew's*, only two rode it out. At *St. Pierre's* (*Martinique*), Mr. J. Anderson stated the wind to have been from the N. W. and W. N. W. At *St. Bartholomew's* it began from the N. W. then blew from N. and at last got round to the S. W. On the 3d, 4th, and 5th of September, Capt. Henry, on a voyage from *Point-Petre* to Philadelphia, was obliged to lie to under *Deseada* for fifty-six hours. The gale was heavy, with rain and thick weather.

Capt. Jones related that at *Point-Petre* there was, on the 4th of September, the most dreadful gale known for twenty years. There happened to be no vessels at *Basseterre*. But at *Dominique*, every vessel had been lost.

On the 4th of September, two brigs, commanded by Captains Lovell and Glazier, were driven out of their ports, one at *St. Croix*, and the other at *St. Thomas*. The gale was so violent as to make them slip their cables with the loss of their best bowers. It lasted thirty-six hours, and was as severe as

any ever recollected. At St. Thomas thirty sail were driven on shore.

Capt. Smith sailed from Demarara on the 21st of August, bound for New-York. He was overtaken by the hurricane on the 4th of September. It blew from the southward and eastward. After being thrown on his beam ends, and losing his foremast and bowsprit, she was rendered so leaky as to be abandoned on the 8th as a wreck.

Capt. Boardman on his passage from Guadaloupe to Newbury-port, experienced the gale from the 4th to the 7th of September. Capt. Day, on his passage from Berbice to the same place, was overtaken by the gale to the leeward of Tobago.

Capt. Mountfort, from Demarara, gave information that the hurricane had *not* been felt there. Capt. Wood declared the like of Grenada.

The gale commenced at *St. Thomas* on the 4th of September, in the afternoon, and lasted three days. During this time it destroyed forty-two sail of vessels. Accounts from the windward stated that the British Packet, from Falmouth to Barbadoes, had been lost. *Guadaloupe*, *St. Bartholomew's* (where thirty sail were driven on shore), *Tortola*, *St. Kitts*, *Antigua* (four sail driven on shore, a packet foundered at anchor, and much damage done to estates in the mountains), *Eustatia*, *St. Martin's*, and, in short, all the *Caribbee Islands* experienced a like fate, with the loss of many vessels, and much other property. There were four wrecks at Anegado.

At *St. Kitts* the hurricane began on the afternoon of the 3d of September. It blew at first from the N. and N. W. On the 4th it shifted to the S. W. and changed frequently to the S. blowing with equal fury in all these directions. It was reckoned to be nearly as fatal in its effects, to shipping and to property on shore, as the ever-memorable one in 1772, and of much longer duration. The quantity of rain which fell was great and sudden, so as almost to deluge the mountains.

2d. *In the Bahama Islands.* The gale was experienced at *Turks Islands* on the 4th of September. It prevailed in the Bahamas with extreme violence. No severer one was ever known. At *Turks Islands* all the vessels ran ashore except two, which put to sea. Most of them were totally lost. Capt. Rhodes, who put to sea, returned thither on the third day after, having sustained no other damage than the loss of one of his boats. The sea had broken into the salt-ponds, injured the dykes and canals, and melted large parcels of the salt in stacks.

But Capt. Waite informed that the gale was severely felt at Nassau in New-Providence, on the 5th and 6th of September. About thirty sail of small craft were driven on shore; but not much damage done to square-rigged vessels. Capt. Backus, who was on his passage from Ragged Island to New-Providence, experienced the gale on the 7th. The wind came first from N. E. then hauled to the W. and afterwards blew N. N. W. and then W. again.

3d. *On the Atlantic Ocean, to the North-east and North of the Bahamas.* Capt. Johnson encountered the gale on the 6th of September, in lat. $31^{\circ} 5'$, and long. 81° . It first blew from the N. E. and from that veered to W. S. W. N. W. and S. W. It was terribly furious, so as to damage his rigging very much, loosen his masts, and render his ship very leaky.

Capt. King, from Demarara, was invaded by the gale on the evening of the 6th, in lat. $21^{\circ} 51'$, and his vessel was thrown on her beam ends. He was forced to cut away her mainmast. Lost a man who was washed overboard.

Capt. Messroon took the gale in the Gulf-stream, lat. 20° , on the 6th of September. The wind was then E. N. E. and continued so until the 7th, then it shifted to S. E. It was very severe, though he escaped without material damage.

In lat. 22° , long. 64° , Capt. Beard was wrecked in the gale. It began on the 3d of September, continued during the 4th, and did not end before the 5th. He and his crew were taken off the wreck on the 9th.

On the 7th, 8th, and 9th of September, Capt. Jenne, bound from Kingston, in Jamaica, to Baltimore, suffered a tremendous gale in lat. 33° , long. 74° . The wind varied between N. E. and S. E.

Capt. Mood, on a voyage from Alexandria (Virginia), to St. Mary's (Georgia), was, on the night of the 7th, in the Gulf-stream, to the eastward of Charleston. The wind there was E. N. E. and so hard as to throw his vessel on her beam ends. She lay several hours in this situation. Several of his crew were washed overboard.

Capt. Miller, on a voyage from Martha-Brae, in Jamaica, bound for Wilmington (North-Carolina), experienced the same gale the same night, on the inner edge of the Gulf-stream. It was so violent as to heave his vessel on her side as she was lying to under her jib, to unstep her masts, and to tear up her deck. In this forlorn condition the crew were fortunate enough to save themselves by getting on board another vessel.

Capt. Andrews, on his way from Charleston to Nassau

(New-Providence), encountered the most formidable part of the gale on the night of the 7th of September, in lat. 26° , long. 77° . She was thrown on her beam ends, her boom broken to pieces, her main-topsail and rigging carried away, and two men washed overboard.

The brig *Augusta* was on her passage from Savannah to New-York when the gale began. She had sailed on the 31st of August, and had progressed no further than the *Frying-Pan shoals*, off Cape-Fear, on September 7th. Being there exposed to its vehemence, they stood off shore as long as she could carry sail; but at half past two P. M. they were obliged to lie to. The weather was turbulent all the night. On the morning of the 8th, the rage of the storm was excessive, beyond what any person on board had ever experienced. It increased until two P. M. and continued all night with unabated fury. At day-light on the 9th, she was about three and one-half leagues from the breakers, on the Roman shoals at Cape Carteret. They were lucky enough to escape these, and to arrive about noon at Charleston-bar, which was one continued breaker, so that no pilot could get out. They were forced to cast anchor on a lee-shore, and with the help of two cables and anchors rode it out until the 10th, when she got into Charleston. Capt. Davidson of this vessel, related, that in the fore-part of the 7th, before the gale began, he plainly saw a brilliant star in the zenith.

4th. *In the latitudes south of the Bahamas.* Capt. Jaggart, who left Jeremie, in St. Domingo, on the 14th of September, declared, that the gale was not felt or known at that place at all. The Captain of a Spanish schooner from Matanzas said, the gale was felt there, but not much damage done.

The British armed ships *Theseus* and *L'Hercule* took the gale first in north lat. $22^{\circ} 12'$, and west long. $63^{\circ} 44'$, on Wednesday, September 5, about eight o'clock P. M. They were then about sixty miles north-east of the "Square Handkerchief," and about one hundred miles north of the "Silver Quays." The gale was in the beginning from the N. E. and, by degrees, came round to the S. E. Its violence reduced them to the utmost distress. It lasted until Friday the 7th, at five P. M. They afterwards got into Kingston harbour, in the island of Jamaica.

Capt. Howe, from Porto-Rico, related, that the gale was experienced there on the 4th of September, and drove ashore every vessel at the west end.

Capt. Bennet sailed from St. Thomas on September 3d.

On the 6th, about thirty miles southward of Porto-Rico, was assailed by a tremendous hurricane. The wind was S. S. E. but frequently varying. The Jamaica papers of the 8th contained accounts of considerable damage done on the south-east side of that island by the gale of the 4th. The north side did not feel it.

5th. *In the latitudes north of Cape-Fear.* It appears that the gale did not prevail much to the northward of Wilmington, (North-Carolina). It was but slightly felt there. On the 9th, a small schooner and periago were driven on shore, but not materially injured.

The brig Wilmington Packet, from New-York, had been ashore on the Frying-Pan, but after taking out the cargo was got off. The crops in the neighbourhood of Wilmington had not been injured.

Capt. Tilford, on a voyage from London to Baltimore, felt the gale on the 3d of September, in lat. 39° , and long. 65° , it blew from E. N. E. and continued in the form of a strong and favourable wind until the 8th, when he made the Capes of Chesapeake. As soon as the gale reached land, it grew more violent, and seems to have parted into two streams. By the assistance of one he then ran up the Bay to the mouth of Patapsco, in twenty hours. The other branch turned southward, along the land toward Cape-Hatteras.

Vessels from Europe, which had not got further south than lat. 39° , seemed to have escaped the hurricane.

6th. *On the Continent of North-America, and the adjacent Islands.* (A) In *Florida* the gale was excessively hard; at St. Augustine the tide rose to an uncommon height. Of nine vessels in the harbour only one rode out the storm.

(B) In *Georgia*. At Savannah the gale began on Saturday morning the 8th. The wind was from the east, yet varying between S. E. and N. E. incessantly. It was more dreadful than any that is recollected to have ever happened there. It commenced by slight wind and rain, until about ten A. M. when it blew with uncommon violence. It was accompanied by heavy rain, and went on increasing until between six and seven in the evening. It did not cease until three o'clock in morning of the 9th. The continuance was seventeen hours. The water rose to between eight and ten feet above the level of common spring tides. Houses and stores were blown down by the wind, and undermined by the water. Fences and trees were prostrated. Ships and vessels were stranded, and left high and dry upon the tops of the wharves. Great damage was done on

the Island opposite the town, and on Wilmington and Skidawa Islands. Fort-Green, on Cockspur Island, was completely levelled; thirteen lives were lost, and all the buildings destroyed. The water was supposed to have risen from fifteen to twenty feet above the level of the fort. The surface of the land was considerably lowered and washed away. One of the national gun-boats was carried about eight miles from her moorings, and landed in a corn-field upon Whitemarsh Island. A cannon, weighing 4,800lb. was carried thirty or forty feet from its position. A bar of lead, of 300lb. was carried one hundred feet. Cases of cannister shot were carried from one hundred to two hundred feet, and muskets were scattered all over the island.

Such was the beating of the ocean against the shores, that at Savannah the rain which fell was of a saline taste. An experiment made by evaporating some of it, proved it to be highly impregnated with sea salt; this was probably derived from the spray of the sea. The water in the river was saltish at Savannah, and for fifteen miles above. Sand was blown into the upper stories of houses thirty feet higher than the surface of the earth.

At St. Simons' Island great damage was done by inundating the crops, and drowning the negroes. The like happened on St. Catharine's, and on the other islands along the coast. At Sunbury, the bluff was reduced to a perfect beach, and almost every chimney was levelled with the ground.

Mr. Isaac Briggs, who was in the interior of Georgia, about twenty-three miles from the high shoals of Apalachy, on his way to Hawkins's settlement, on Tallapoosa River, arrived at the house of an Indian trader there on the 8th of September; here he was detained two days by severe stormy weather. In his letter to Mr. Jefferson he remarks, "that sometimes the ear could scarcely distinguish an interval between the sound of one falling tree and that of another." The wind was north-east.

The gale was distinctly felt in the upper country as far as it is settled, which is to the distance of three hundred miles from the ocean. It was felt there as a strong *wind* which blew down the corn, but was not hard enough to prostrate trees. There it blew from the north-east, and began on the afternoon of Saturday, the 8th. The rain did not begin until in the evening.

(C) *In South-Carolina.* At Charleston, the gale was more furious and long-continued than was ever known since the hurricane of 1752. It prevailed there on the 7th, 8th, and

9th of September, and exceeded, in violence and duration, the great storm of 1783. It began at Charleston on the 7th, about eleven P. M. and continued until Sunday morning, the 9th, at one. The wind was at first north-east. In the course of the morning of the 8th, it shifted to the east, and in the afternoon to south-east. It lasted for nearly thirty-six hours. But three or four of the vessels in the harbour escaped without injury. Many were much damaged, and several wholly lost. The whole of the wharves, from Gadsden's, on Cooper-River, to the extent of South-bay, received considerable damage. Many stores were washed or blown down, and much property lost. Numerous houses were unroofed, and trees overturned.

On Sullivan's Island fifteen or twenty houses were undermined by the water, and carried away. Fort Johnson, which had been long in a tottering condition, was destroyed, so as not to admit the mounting a single cannon. The breast-work and pallisadoes of Fort-Pinckney were washed away. From Fort-Moultrie, near which the sea made a clear breach to the Cove, every spot was covered with water.

At Jacksonburgh the crops of corn and cotton were much injured. The bridges were carried away between Charleston and George-Town, and so many trees blown across the roads as to obstruct the stages for several days.

At May-River all the crops, cotton, and negro-houses, machines, &c. were completely swept off. The tide rose nine feet higher than the highest spring rise. On Hutchinson's Island, many negroes, and some white people, were drowned. The like happened at Dawfousky and Broughton's Islands.

At Coosahatchie trees were thrown across the roads, and bridges carried away, so as to prevent intercourse through the country; that village was entirely surrounded by sea-water. In Prince William's parish, Beaufort district, the storm was experienced in an awful manner. The sea formed a junction through the streams of Pocotaligo, Stony-creek, and Huspa rivers, in such a manner as to turn Scotch-neck into an island. Through the fields, at Sheldon to Motley, the water covered the plantations four feet deep on the high road and causeway leading to the meeting-house, rendering the roads impassable. Great destruction was made upon the crops of rice and cotton, and many animals of various kinds were drowned. Nothing but the high ground was visible on the roads of the *Fish-pond* and *Horse-shoe* savannas.

The gale began at *George-Town (South-Carolina)* be-

Between three and four A. M. on the 8th of September. The wind was at N. E. and blew with increasing violence until midnight. It then changed to S. S. E. and abated little of its fury before the evening of the 9th. The rain descended in most profuse quantity the greater part of the time.

The gale extended to the upper part of the country as far as the mountains, to a distance of two hundred and fifty miles. It blew from the N. E. and was so violent at one hundred miles from the sea-board, as to blow down forest-trees in great numbers, so as to render the roads impassable for carriages.

From a consideration of all these details, it appears that the gale extended from beyond the latitude of Tobago, in 12° north, to the latitude of Wilmington (North-Carolina), northward of lat. 34° , sweeping a tract of ocean at least twenty-two degrees in extent. It probably exceeded by far these limits, as Capt. Tilford felt it as far north as 39° . It appears also that it reached from the longitude of the windward islands, in 60° west of Greenwich, to the mountains and back settlements, travelling over a surface of as many degrees in that direction. And its prevalence was, in all likelihood, much more wide and diffusive than has come to my knowledge.

The gale in the islands blew from north north-west, and even from the south-west, but as it approached the coast, got round to the eastward, and varied between north-east, east, and south-east. It arose to windward in both the *north-eastern* and *south-eastern* quarters. In this respect it widely differed from the great north-east snow-storm described in Med. Rep. Hex. i. vol. 5. p. 465. which began to leeward.* It seems to have

* So did the one which is described in the following account:—But these snow-storms from the north-east do not seem always to blow the whole length of the coast between the Gulf of St. Lawrence and the bay of Mexico. The winter of 1804—5 was the most rigorous that had happened since that of 1779—80. One of the snow-storms which occurred during the latter winter, illustrates at once the fact of their beginning to leeward, and of their limited extent in certain cases. It also shows that they prevail at different places with very different degrees of violence. The weather had been intensely cold during January; the quick-silver had some times been as low as 3° above O, and frequently down to 11 and 14° . After this uncommonly severe weather, the atmosphere rapidly became warmer, the mercury rose to 46° in the course of a few days, and immediately a thick and heavy fog overspread the ice on the rivers, and the snow on the earth. This continued until the 26th, when the cold increased again. About four in the afternoon of that day, snow fell at Washington, and there was a mingled fall of snow and rain at Georgetown, (Maryland). This storm was felt at New-York city in the fore part of the evening, and not until eight P. M. by the ship Favourite, then off

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taken about four days for the *south-east* current (from the 3^d to the 7th), to force its way along from Tobago and Barbadoes to Augustine, Savannah, and Charleston. In like manner, by comparing the times of its commencement along the Fredish coast, it is evident that the *north-east* current blew violently near the Frying-pan-shoals at half past two P. M. on the 7th; that it began at Charleston at eleven the same night, and did not become formidable at Savannah before ten in the morning of the 8th, consequently it did not begin at Charleston until eight hours and an half after it began at the Frying-pan, nor at Savannah sooner than the nineteenth hour and an half subsequent to its commencement at the same place. Hence, on comparing this storm with the one before alluded to, it is evident that this which had its rise to windward was not near so rapid in its progress as that one which took its origin to leeward.

From all these facts and considerations there is reason to believe, *that this gale, consisting chiefly, as it advanced toward the Continent, of currents from the north-east, east, and south-east, was the trade-wind diverted from its ordinary course, and blowing with a force prodigiously augmented over a tract, considerably to the northward of its usual limits.* The two columns of agitated atmosphere moving obliquely toward each other, appear to have met and expended their combined forces upon that bend of the coast which forms the front of North-Florida, Georgia, and South-Carolina. At present I know too little of atmospheric movements to determine what was the particular *rarefying* or *expanding cause*, that, on this occasion, put the windward air into such destructive commotion, made it rush with such resistless impetuosity to leeward, and more particularly determined it to quit the intra-

Boston harbour. At Newbury-port the newspapers state it to have begun on Sunday morning the 27th. By a comparison of the facts, it will be found that this storm began at least four hours sooner on the Potowmac than in Boston harbour. The difference of time was no less remarkable on its cessation, for it had ceased so entirely at Washington on Sunday night, that the weather had cleared up on Monday morning the 28th. In New-York it continued until Tuesday morning, and lasted at Boston until Tuesday evening. Though the storm was not of long duration at Washington, and the fall of snow was moderate there, yet it was far otherwise in New-York and Massachusetts. The quantity of snow which fell in both those places was uncommonly great. Many vessels were wrecked and lost on the coast of Massachusetts in particular; and in the latter, this snow-storm from the north-east lasted thrice twenty-four hours, while in Maryland, it did not at furthest continue more than half the time, and certainly with less by far than half the violence.

tropical regions, and exert its whole strength upon a part of the Continent, so far to the northward as that which lies between St. Augustine and Wilmington, betwixt the latitudes of 29 and 34° north.

ARTICLE III.

FACTS concerning the YELLOW FEVER which prevailed in Charleston (South-Carolina), during the hot Season of 1804; with Observations on the Damage done to the Crops by the Hurricane and Insects: Communicated by DAVID RAMSAY, M. D. &c. to Dr. MITCHILL, in a Letter, dated Charleston, December 14, 1804.

THE particulars of our late epidemic yellow fever would have been transmitted sooner, but were kept back in expectation of obtaining from the proper officer, the precise dates and exact numbers of persons who died of that disease in this city last summer. This has been often asked for, and as often promised, but never given. From the want of it, I must substitute my own recollection and conjectures, in place of recorded facts, as far as dates and numbers are concerned.

A few cases of yellow fever occurred prior to the 10th of July, but from that day till about the 20th of September, it might be said to be epidemic. From and after that time it gradually declined, and, finally disappeared about the first of November. There were very few unequivocal cases in or after October. The whole number of deaths, from first to last, was between two and three hundred. The weather was uncommonly warm while the epidemic raged, and the number and mortality of its subjects increased with the increase of the heat. The disease was marked with the ordinary symptoms which have been so often described, and are so well known, as to make a new statement unnecessary; but in the following particulars, an unusual proportion of patients deviated from what had been the more common form of the disease in preceding years. Neglected intermittents frequently terminated in the yellow fever. The black-vomit was neither violent nor constant, even in fatal cases, where the depleting system was carried to a proper extent. Several cases of clearly-marked yellow fever terminated in low nervous fevers, which ran on to a period of two or three weeks, and in different cases with op-

posite results. The disease bore tonic medicines better and earlier than in the preceding years. Blisters were uncommonly useful, and when applied freely and judiciously, saved several lives.

As usual, the disease was confined to persons who were strangers to the air of Charleston; but it attacked some who had resided among us one or two years, and in a few cases more. In the year 1803 we had no yellow fever. This encouraged a considerable number of strangers to remain in Charleston. In persons attacked with the disease after a residence of two years and upwards, there has generally been a great proportion of the exciting causes, such as intemperance, long exposure to the damps of the night, or the scorching rays of the sun.

About one-fourth of the strangers among us escaped the disease, and more than one half of those who took it got safely over it. This disease in no instance proved contagious. Neither physicians nor nurses attending the sick were attacked with it.

Such persons as removed from the thickly-settled parts of Charleston, and fixed their residence in its environs, were sometimes attacked with intermittents, but, in no case to my knowledge, with yellow fever, while they steadily kept aloof from the air of the crowded city.

On the eighth of September we had an hurricane, which exceeded every thing of the kind since the year 1752. The summers of both these years were uncommonly warm, and were followed by very mild autumns. The trees which lost their foliage by the violence of the hurricane, have had it replaced by new leaves. These, flourishing with the vivid green of spring, in many instances continue to this day. Fruit-bearing vegetables have blossomed afresh since the eighth of September, and young fruit is frequently to be seen. Ripe mulberries have been eaten in the last week of November.

For about a fortnight immediately following our last hurricane, there was no sensible abatement of the reigning diseases; but from the end of that period to the present day, the inhabitants of Charleston have enjoyed as much health as could be expected in the mildest season of the most salubrious climate. Of the few fevers we have had, most of them wore the livery of the yellow fever.

The year 1804 has, nevertheless, been to us a very disastrous year. The hurricane destroyed in some plantations the whole, and in others a half or a third of the crops. Caterpillars have also made extensive ravages on the growing cotton plants.

These insects advanced from the sea-coast westwardly. The mischief done by them was greatest where they first appeared. In the western parts of the State they were sometimes useful, for the pod being advanced nearly to maturity before their arrival, they attached themselves oftener to the leaves than to the cotton. The force of vegetation was therefore more concentrated in perfecting the latter. The long-continued mildness of the autumn has, in some small degree, compensated for the ravages of the hurricane, by extending the period for the growth of junior pods.

Worms for a few years past have attacked our pine-trees, and, by boring holes through their trunks, have destroyed so many of them, as to threaten a scarcity of that valuable wood, if their ravages continue; but we indulge hopes to the contrary, as they have been rather stationary than advancing for some time past.

Another insect, generated on the cob of Indian corn, eats out the substance of the grain. The only preventive yet known, is by shelling or kiln-drying the corn early in the season.

We are loudly called upon to ascertain the natural history of these several insects, and, if possible, to obtain light, from a knowledge of their habits, how to effect their destruction. Some inquiries have been directed to these points, but hitherto without effect.

ARTICLE IV.

An ACCOUNT of the FEVER which prevailed during the Summer and Autumn of 1804, in the Neighbourhood of Codorus Creek and the Borough of York, in Pennsylvania: In a Communication from Dr. MAXWELL M'DOWELL to Dr. MITCHILL, dated York, November 24, 1804.

DURING the months of April, May and June this year, we had an unusually rainy season; so much so, that the farmers were very much retarded in their preparations for a spring crop. The rains were so heavy as to make the Codorus overflow its banks several times. Indeed, every rivulet was often swelled into a formidable stream. The farmers lost the principal part of their first crops of clover-hay, in consequence of the heavy rains and cloudy damp atmosphere; vegetation, however, flourished exuberantly. North of the borough, to

the distance of about a quarter of a mile from the Codorus, there are about eighty acres of low ground, or what is commonly called *natural meadow-ground*. A large portion of this ground is overflowed in the time of high water. On the northern verge of this flat tract of land are three farm houses. In two of those houses, about the middle of July, I first met with the febrile disease that, in a short time, became epidemical in town and country. A few yards from the door of one of the houses, there was a large mass of vegetable matter conveyed by the high water, and left upon the ground when the water receded. When this mass was acted upon by the hot weather of July and August, it became a noisome collection of putrescence. In some of my visits to that house, after sunset, the effluvia from the corrupting mass were extremely offensive to my organs of smell. In my opinion, the connection between cause and effect cannot be more apparent, than that the cause of our prevailing fever was itself the product of putrefaction. There was no regular account kept of the atmospheric heat of July and August. On one of the days of August the mercury in the thermometer stood at 91° in the shade. This was considered one of the warmest days of our summer.

The first symptom of disease, with many people, was a severe pain in the fore part of the head. In some cases the pain was confined to the eyes. One young lady whom I visited told me, that her eyes felt as if they would "burst." In some cases, a vomiting was the first symptom. A man, whom I visited a short time after the commencement of his disease, told me, that he felt most severe pain in the "bones" of his legs. The loss of twenty ounces of blood entirely removed that symptom. The fever was, however, mostly ushered in by a slight chill. The people very soon entertained the opinion of its being a contagious fever. This opinion prevailed so much, that it was often impossible to procure nurses for the sick. Two young women, who acted as nurses, in succession, to a family about half a mile from the borough, were seized with the fever. This circumstance confirmed superficial observers in their opinion that the fever was contagious. They did not consider that those young women were exposed to the same putrescent vegetable source that caused the disease in the first person of the family who became sick. In a few days after the appearance of the first cases of the fever that came under my notice, I had numerous invitations to visit patients in the country, some four, some eight, some ten, and some twelve miles distant from

the borough. I met with the same febrile disorder in all those places, and I never had any difficulty in discovering the local cause of its origin.

The fever was most prevalent in those parts of the town adjacent to the Codorus. The most elevated situations, however, that in former years secured their inhabitants from autumnal fevers, did not protect them from the prevailing fever of this year. The luxuriant growth of vegetables, during the spring months, seemed to render them incapable of bearing the heat of July and August. The cabbage, in most of the gardens in town, rotted very much in August. An intelligent farmer, of the society of Friends, whose house stands on an eminence, about two miles from town, informed me, that he never walked along the fences of his farm, in the month of August, but he felt the unpleasant smell of putrefying vegetables. There was not a stagnant pool of water on his farm; yet all his family had the prevailing fever.

My mode of cure consisted of a few remedies, regulated according to my opinion of the degree of disease with which I had to contend. When I was called in early to visit patients, whose head or eyes were much affected with pain, I made a free use of the lancet, and always with evident and speedy relief of those symptoms. In cases where nausea was the principal uneasiness, my first prescription was an emetic of tartarized antimony; the operation of which seldom failed to relieve the stomach of nausea, and reduce the force of the febrile action. In some cases, the loss of eighteen or twenty ounces of blood reduced the disorder to the intermittent form of fever or ague. But I was often obliged to make use of a second and a third bleeding before the fever yielded. I gave calomel and jalap in doses of ten grains each to an adult, after blood-letting in cases that required the use of the lancet, and after an emetic in cases where that was my first prescription. I had two patients, both delicate females, the one in the third, and the other in the fifth month of utero-gestation, whose fever I was unable to subdue till I excited a mercurial disease in the glands of the mouth. In both cases, every symptom of fever disappeared as soon as the mouth was considerably affected by the mercury. One of those ladies is now in perfect health; the other is the lady in whose house the two nurses above mentioned became sick, and as she was under the necessity of attending to her family affairs before her strength justified so much exercise, she was subject to several attacks of intermittent fever, which retarded her recovery. Neither of these ladies was ex-

pected to recover by any person who saw them. I did not apply blisters in any except three cases. The blisters were not productive of any perceivable good effect unless in one of those cases.

On the twenty-third of July, I was requested to visit, with her attending physician, Miss R. W. about seventeen years of age, a young woman of light coloured hair and fair complexion. She was then in the eleventh day of her fever. I found her comatose, and her skin very yellow. The tunica adnata did not present to view a shade of its native colour. Her pulse was small, quick, frequent, and feeble; her breathing laborious. I considered her disorder above the reach of medicine. She died the next evening. From the account that her physician gave of his treatment of her case, it appeared evident to me that he had administered medicine too feeble for her degree of febrile action. In the beginning of her disorder, he administered laxatives of the most gentle kind, such as senna and manna, &c. The day before I was called in, he said he gave her six grains of calomel, with a portion of jalap. He was one of the physicians in this place, who reprobated my use of the lancet, as well as my free use of calomel in our prevailing fever. As this young woman's disorder bore so much resemblance to yellow fever, I was anxious to be informed of its closing scene. Her mother informed, that on the day of her death she had frequent dejections of a dark, foetid and flaky substance; but she had no vomiting. Her disorder, however, would probably have been pronounced yellow fever, if she had died within reach of the *contagion*-bearing ships!

I lost but two patients in the fever, of those whom I attended from the commencement of their disorder. One of the two was a young woman who obstinately refused to comply with my mode of treatment in the beginning of her fever; the other was an aged black woman, whose disease bid defiance to all my exertions,

About the twenty-fourth of August I felt the approaches of the fever on my system. For several days I laboured under such a degree of vertigo, that, when walking, if I suddenly turned my head to either side, I was in danger of losing my perpendicularity. On the twenty-seventh, I was seized with a severe pain in my head, with nausea and fever, which made it necessary for me to prescribe for myself. I drew 18 ounces of blood from my arm, and formed 20 grains of calomel and 20 grains of jalap into pills, which I took at once. My bowels are not easily moved by a cathartic, and I wished this portion to have a brisk emetic as well as cathartic operation. What

will those gentlemen who reprobated Dr. Rush's *ten and ten** in 1793, say of my Herculean dose? Yet large as it appears, in five hours after I swallowed it, it produced two or three moderate emetic operations; after which I passed a night of severe sickness, and next morning had two gentle dejections. The calomel, however, was not inactive, for it gave me a very sore mouth, and brought on a copious ptyalism. As soon as my mouth became sore, every symptom of my fever vanished. Although relapses were very frequent among my patients, yet I experienced none myself. There can be no doubt respecting the quality of the medicine that I took, as five grains of calomel, and five grains of jalap, taken out of the same bottles, proved sufficiently purgative on some of my most robust patients.

I have lately met with several cases in which the fever terminated in ascites and anasarca; but I believe they were uniformly cases in which depleting medicines had been neglected, or too sparingly administered in the beginning of their disease. Two or three white frosts put an entire stop to the occurrence of new cases.

ARTICLE V.

A NARRATIVE of FACTS concerning the INTERMITTING and REMITTING FEVERS prevalent at George-Town and Washington, in Maryland; in which BLACK-VOMITING is an occasional Symptom. Drawn up by Dr. CHARLES WORTHINGTON, of George-Town, and communicated to Dr. MITCHILL, December 19, 1804.

THE long-continued series of moist warm weather, and the frequent rains that occurred in the course of the last spring and early part of the summer, produced a more abundant vegetation than is usual in this part of the country. The fields, meadows, and low grounds were all covered with an uncommonly luxuriant growth of grass, weeds, &c. and there was an appearance of an abundant hay-harvest; but the wet and cloudy weather continuing until the time of harvest, large fields of clover, extremely luxuriant, were suffered to fall and rot upon the surface, or, if cut, it was thrown into heaps, and so

* Ten grains of calomel combined with ten of jalap.

remained until it rotted, there not being a sufficiency of dry weather and sun to cure it. About this time too, there were heavy falls of rain, which overflowing the meadows and low grounds, bore down the grass, weeds, and shrubs, and deposited upon them large quantities of mud and filth. These floods of water also broke and swept away all the mill-dams in almost every part of the country. This vast mass of putrefying clover, and other decaying vegetable matter upon the fields; the quantity of grass, weeds, and shrubs, covered with mud on the meadows and low grounds, and the numerous surfaces of drained mill-ponds, when exposed to the rays of the sun after the weather became hot and dry, would afford a sufficient exhalation of noxious miasmata to produce fever, with very formidable symptoms, in every part of the country exposed to them; and to this, I think, may be attributed the unusual prevalence of intermitting and bilious remitting fevers, during the last summer and autumn, in many parts of the country generally healthy.

Intermittent and bilious remittent fevers prevailed more generally in the neighbourhood of this town last autumn than in common years; but their ravages were confined principally to the vicinity of overflowed grounds and drained mill-ponds, while remote situations in the more elevated, level and poor lands remained healthy. The town of Bladensburgh having large meadows adjoining to it, which were inundated while covered with a heavy crop of grass, suffered very considerably. Scarce a person in the town escaped an attack of intermittent or bilious remittent fever, and several died; some of them, I was informed, with very malignant symptoms. In several parts of the city of Washington, exposed to exhalations from the marshes and low grounds, the inhabitants were sickly. One family which I attended, within the limits of the city, and to which belonged a number of negroes, suffered from a peculiar cause. Those negroes occupied eight or ten small houses, situated near each other, to each of which was attached a vegetable garden, thickly set with cabbages, from which a quantity of the bottom leaves had fallen and lay rotting upon the ground. From those decaying leaves I was sensible of a disagreeable smell as I passed among the huts, and have no doubt that the exhalation from them was the cause of the fever which prevailed among those negroes. In the course of a week or ten days, fourteen or fifteen of them were confined with intermitting or remitting fevers; all of them speedily recovered under the common mode of treatment except one, a robust young woman, whose fever was of much higher grade, but terminated favourably ulti-

mately, with a painful suppuration of the right parotid gland. Although this town is generally healthy, and was as much so last summer and autumn as it has been in any preceding year, owing probably to the floods of rain, washing away the filth from the streets and different parts of the town, yet we did not escape attacks of the bilious fever, some few of them of very high grade. The autumnal fever of this town and the neighbouring country is generally mild, and admits of easy cure; but I have occasionally seen, within the last ten or fifteen years, cases of bilious fever on the Potowmac, as high up as the Great-falls, in different parts of the country, and in this town, attended with such malignant symptoms, although not always attended with black-vomiting, as would constitute what is now called yellow fever. Two cases lately occurred in this town, one of them in July 1803, and the other in August last. I will give a short account of the first. A remarkably stout healthy man went to Alexandria during the time of the fever there, and was exposed upon the wharves some time while he was executing his business. As he did not wish his family to know of his going, he walked to Greenleaf's-point in the city, and went from thence in the packet, and returned by the same rout much fatigued, as the day was very hot. The night after his return, he was seized with a chill, which was succeeded by a violent fever, that did not yield to the prescriptions of his physician. On the third day, a black-vomiting came on, and continued until the night of the fourth day, when he expired. I saw him a few hours before his death. The other was a female, near forty years of age, corpulent and healthy, whose residence was in a low situation, near the side of the run of water that passes through the centre of the town. As she was sometimes incommoded by high freshets, she determined to protect her garden and dwelling, by raising a wall to dam out the water. This work she superintended in person several days, in hot weather, exposed to the rays of the sun, protected occasionally only by an umbrella. In a day or two after she was attacked with an irregular intermittent, which, after four or five days, assumed a more continued form, and she became seriously ill. Her friends urged her to apply for advice, but having an utter aversion to medicine, and trusting to the strength of her constitution, to "shake it off," she refused. Hearing of her illness, and having for many years attended the family, I called to see her. She refused to admit me to her bedroom, but came to me in the parlour, to convince me, she said, that she was not ill enough to take medicine. She was

much reduced, scarcely able to walk across the floor; her skin cold and clammy; her pulse weak, frequent, and oppressed; her tongue moist, and covered with a light brown fur; her countenance sunk, and her eyes of a yellow tinge. I told her she was very ill, and endeavoured to prevail upon her to permit me to prescribe for her, but without effect; nor could she be persuaded to take more than a single dose of medicine, which was a cathartic, during her illness. On the third day, I think, after my first seeing her, she complained of great heat, oppression, and sickness at the stomach, and the next day began to vomit or gulp up, large quantities of black flaky matter, mixed with a thin mucous fluid, which continued to be discharged at short intervals for twenty-four hours, when she expired. This patient might probably have been relieved in the early stage of the fever, if proper means had been used. I have seen several persons ill of the yellow fever, who have come to this place from Baltimore and Alexandria, and died here. The symptoms corresponded exactly with those of the cases above-mentioned. If it should be said that in the first case the contagion was received in Alexandria, the second case proves, that a solitary case of fever, terminating with all the symptoms of genuine yellow fever, may be sometimes found even in George-Town, where the inhabitants are generally healthy, and no trace of contagion exists. The subject of this last case was remarkably domestic, seldom went beyond the limits of her own lot, and had not been with any sick person whatever.

ARTICLE VI.

A HISTORY of the extraordinary SEASON of 1804; and of the luxuriant VEGETATION, great RAINS, and subsequent SICKNESS in August, September, and October; as they appeared near the River Monocasy and in the upper Parts of Maryland. Drawn up by GRAFTON DUVALL, M. D. of Fredericktown (Maryland), and communicated to Dr. MITCHILL, in a Memoir, dated January 2, 1805.

I WILL, with the utmost pleasure, now perform the promise I made you last month, to give you a concise account of the facts which fell under my observation, respecting the prevalence of the late epidemic amongst us; together with

those which relate to the soil, season, and atmosphere of the surrounding country.

The better to understand the causes which gave rise to this destroying epidemic, it is necessary that I should briefly review the phenomena which relate to the state of the atmosphere, the seasons, and the diseases of the preceding years. I cannot, I confess, do this with the correctness I could wish, and with which is proper it should be done, as I took no notes particularly on the subject, and as I made no meteorological observations on the state of the weather for this period. I must trust, therefore, to my memory for the facts *generally and at large*, which are necessary for my purpose, and shall avoid mentioning any thing which may involve doubt, by relating occurrences which were singular or did not frequently offer.

The winter of 1801-2 was generally mild and open; and during the greater part of it, disease did not much prevail. A few cases of pleurisy, peripneumony, and catarrh occurred. These universally yielded to the power of the measles, which made their appearance in the latter end of the winter and early in the spring, and exercised the sway of a reigning epidemic. Mildness, however, for the most part, characterized them in our neighbourhood; occasionally we met with a case in which they were severe, but in very few instances were they fatal in their termination. In Loudon county, Virginia, separated from the county in which I reside only by the Potowmac, I am told they were extremely severe, and in many cases mortal. They appeared to the north of this place first, and seemed to progress, though slowly, to the south. They were prevalent in Philadelphia and Baltimore before they reached us, and pursued a S. and S. W. course as far as I heard of their progress. They are described, as they appeared in Baltimore, by Dr. Potter, in vol. vi. p. 353 of the "Medical Repository;" I shall therefore add nothing on the subject.

Having spent its force, this disorder vanished gradually, and left our adult citizens to enjoy good health throughout the summer months generally, which fluctuated extremely between moderate and oppressive heat, and also between rain and dryness. Amongst children, the cholera prevailed to a considerable degree. It was obstinate and fatal to many of this innocent and helpless class. It did not yield kindly to the treatment which had been generally observed in similar cases in preceding years. It is lamentable truly to remark, how inefficient medicine has commonly proved to be in this distressing and fa-

tal complaint, to which infancy appears particularly liable. As autumn approached, I found that the number of the sick increased, affected with remitting and intermitting fevers. Of these, however, there were but few, compared with the number we have since witnessed to be affected with the same disorders. Nor were these cases obstinate. They yielded, for the most part, to the usual evacuates, (one of which was blood-letting, more necessary in this than the following years, as I shall hereafter have occasion to remark) followed by the bark. In October, a large number of persons, after being subjected to an attack of the bilious fever, either in the remitting or intermitting form, without any perceptible cause to produce the change, fell into a cholic, which may very properly be termed a *symptomatic cholic*. Some, to be sure, were attacked *immediately* in this manner. Such cases required no alteration in the method of cure. These cholics proved unusually severe and obstinate. In the plan of cure, experience taught the practitioners of medicine to keep a watchful eye, as well to the system generally as to the alimentary canal, and its affections particularly: for although, in this variation of disorder, we were always obliged to prescribe from the *symptomatic* appearances or affections, still it was necessary to administer the remedies necessary for the removal of a general constitutional disease. The only difference which occurred in the varying symptoms was this, that when a strong and severe cholic-like affection took place in the stomach and bowels, there was an apparent absence of fever, and of ague or chill also.* In other respects the symptoms were the same; the exacerbations took place in the same manner in both forms of complaint; the pulse, the head-ach, the sick stomach were the same. The *painful* paroxysm returned periodically, imitative of the ague or chill, observed the same duration as the fever, and always went off, leaving the same symptoms. The method of cure was therefore predicated on the same principle in both forms of complaint. In the first case which came under my care, and which presented in the very earliest weeks of my practice, without a full consideration of the subject, or the symptoms, and without that regard to the influence of a prevailing epidemic which all practitioners should have at the time, in prescribing for *any* form of disease, I administered the remedies which

* Dr. Rush, in vol. iii. p. 63, of his work, mentions a single fact, accountable for on the same physiological principle. He mentions the cases of patients in yellow fever seized with symptoms of mania. "In these there was an apparent absence of fever."

are usually given in the common cases of bilious cholic and constipation, as it is usually called here, and which is frequent amongst us; under the idea, that as soon as due evacuations from the bowels were had, or as soon as spasms were relaxed, relief to the patient would immediately follow. I was therefore equally astonished and chagrined to find, that although frequent blood-lettings were had, although emetics operated well, purgatives had all the effects I could wish, blisters acted well on the skin, and opiates and warm bath, and other more powerful antispasmodics, as æther, &c. were administered; the disease, or to speak more correctly, this painful symptom of disease, would still return after the usual intermission at its periodical time, with increased strength. In this mode of treatment I was likely to lose a patient, who, independent of this untoward complaint, was a strong and healthy man, and my feelings were not enviable. I had but lately returned from the Philadelphia school of medicine, where I had doubted the soundness of Dr. Rush's doctrine of *unity of disease*. At a loss what course to pursue, distressed in mind, and feeling great anxiety for the issue of the case, I determined to test, by practical experiment, the accuracy of the Doctor's idea, by treating this new species of intermittent in the same manner I had been accustomed to cure the common intermittents successfully. Having, at this stage of the complaint, evacuated sufficiently, I determined to prescribe the bark in the next intermission of pain which took place, which generally occurred early in the morning. Accordingly, at an early hour, I exhibited a full dose of red bark, in port wine, with directions that it should be repeated every hour until noon, the regular time of accession of pain. I visited the patient at twelve o'clock, and found that he had as yet no pain. For fear, however, that it might return, and be increased by the bark, or that the medicine might create fever, I directed but one dose to be given in three hours, as long as pain and fever did not make their appearance. At five o'clock on that day, the patient was free of complaint, and as the return of paroxysm did not take place as usual, and as several hours had now elapsed, he determined to omit taking the bark until the next morning, under the idea that it would not return at a misplaced time. The consequence was, that between nine and ten o'clock that night the pain returned with as much violence as ever. This satisfied me of the power of the bark over the complaint, and inspirited my patient to hope the best effects from a diligent continued use of it. The next day he took an ounce

of the medicine without experiencing the return of the pain. By the occasional use of this happy remedy every day for a few days, he was restored to perfect health; and I am happy to add that he has not had a return of the complaint in that form, unless I except a slight threat of it while under the influence of the epidemic as it lately prevailed. My mode of practice has, since that time, been materially governed, in similar cases, by the result of this trial, and I have had no just reason to alter the plan.

I mention this particular case to illustrate what I had previously spoken of as to the identity of the disease appearing with such varying and unusual symptoms. I hope it is sufficient for that particular purpose. How far this, and similar cases which have fallen under my observation, go to substantiate Dr. Rush's idea of the *oneness* of disease, I leave you to judge. For myself, I will not conceal that it has powerfully impressed on my mind the great ingenuity of the doctrine of our illustrious American Professor. What fate it is finally reserved to meet, I will not allow myself to predict: *at all events, I hope his plausible principle will teach American physicians never to prescribe for the names of disease, but for the state of the system.*

Throughout the fall, cases (an instance of which I have just described) occurred frequently, until the severity of the season checked the prevalence of all bilious disorders, or in their stead, brought on others of a more inflammatory order. The succeeding winter was healthy, and, like the preceding, mild and dry. No general complaint deranged the health of our citizens during the winter or spring. A few cases of inflammatory complaint occurred, which were easily remedied. The spring* was long, cool, and wet, succeeded by one of the driest summers ever remembered. In April we had severe frosts, which almost entirely destroyed our fruits of every kind. That which escaped the withering nips of the frost, afterwards fell beneath the beats of hail, the most terrible and heavy storm of which remembered by the oldest inhabitant of the neighbourhood, fell on the 16th of May. Its direction was from the north, and extended southward.

* The waters of the rivers and creeks overflowed their banks several times this spring. This is necessary to be remembered as an important fact, accounting for the prevalence of bilious complaints immediately on and about creeks, rivers, and low grounds. Hereafter I shall show that these places, during the late epidemic, were healthy. A great deal of rain fell this spring.

The space in which it fell did not exceed, in length, above six or seven miles, and in breadth, three or four miles. It destroyed almost all the forward vegetables in the gardens over which it passed; cut off all the rye* which stood in its way (many fields of which afterwards, in harvest-time, had not a sickle carried into them); and considerably injured the wheat, which, however, was not, luckily for the owners, sufficiently grown to be broken in the stalks. Its ravages in town were very great; all the window glass exposed to the north were broken; and so sudden and unexpected was its approach, that the mischiefs were all done before they could be prevented.† For two or three weeks immediately preceding this severe hail storm, the weather had become excessively warm. The morning on which it happened was unusually warm for the season, and continued so until the black cloud, from which the hail showered, rose and discharged its contents. For a day or two afterwards the weather was cool.

I have mentioned that the summer was uncommonly dry. The drought had commenced very early in May, and continued after the hail storm, throughout the summer. The consequence was, that scarcely a full crop of any produce from the soil was made. The grass even in the meadows was parched; the corn fired; the wheat and rye, for the want of moisture and dews, could not thrive.

It was predicted by many, that our citizens would be unhealthy in consequence of the scarcity of fruit, and the dryness of the season. It was a mistaken prophecy, and experience taught the reverse. I shall hereafter mention a similar *reverse* prediction, which was equally fallacious.

About the time we speak of, our town, and the country also, was very healthy; and if we except the cases of bilious diarrhœa and cholera infantum amongst children, which prevails in every year more or less during the continuance of the

* The rye in many places was just beginning to head.

† I was witness to a remarkable instance of second vegetation, or growth, this summer. Opposite to where I live there had been transplanted, two or three years ago, a young locust tree. It stood on the north side of the street, and was therefore exposed to the violence of the storm, which almost entirely divested it of its tender leaves, and broke several limbs. The ragged leaves afterwards fell off withered, and the tree appeared to decay and deaden. I had supposed the tree to be dead for some time;—to my utter surprise in September, and, to the best of my recollection, very late in the month, it budded, put forth, and was in full bloom when the foliage of other trees began to change colour, wither, and fall off. The contrast (for it was in a line before the door with other trees of the same kind) was beautiful and interesting.

hot weather, they continued eminently so until after the autumnal months had set in. At this period, chills and fevers took their rise, and began to prevail more generally amongst those whose dwellings were situated upon the Potowmac and the streams emptying into it below our town. Beyond the Catoctin mountain, and in the valley between that and the South mountain or Blue Ridge, to the Pennsylvania line, the country was as healthy as it ever had been known to be. It was healthy also in the upper parts of our county on this side of the mountain, until you approached the water courses or low lands. In the tract of country bordered by the Potowmac, the Monocacy, Callenger's creek, and the Catoctin mountain, in length twelve or fourteen miles, and in breadth eight or ten miles, the inhabitants were much afflicted with agues, chills, and the different types of the bilious fever. It is very thickly settled. What few cases occurred beyond the mountain, were on those plantations immediately on or neighbouring to the Potowmac—and such cases appear annually. It was but seldom fatal: it bore hardest on the old and infirm. In several instances this fall, the bilious attacks came in the dress of a cholera, as in the preceding year: they were, however, removed by the remedies usually employed in the common forms of that complaint.

As the cold weather advanced, the type of disease changed, and assumed the more terrible appearance of inflammatory disposition, ending in nervous fever. The hard weather commenced early in December, after a dry and agreeable autumn, and continued, for the most part, severe throughout the winter. Much snow fell in January and February, which lay until March had far advanced. Many cases of violent inflammatory fever occurred; several of which proved fatal in town, chiefly amongst the young, healthy, and robust. In those states of fever the lancet was loudly called for, and blood-letting borne to a great extent. The pulse was strong, full, hard, and, in early stages, very tense. A young lady labouring under this state of fever, was bled eleven times, as I was informed. The case ended fatally just about the time her physicians supposed they had arrested the career of her disorder. One of them informed me the next morning after her death, that it appeared to him "as if the disease and the powers of life gave way at the same time."

This was a fatal winter to persons afflicted with pulmonary complaints.

I am now come to that season of the year, which, in my

opinion, laid the first foundation for the epidemic, which prevailed amongst us so generally afterwards, not only in the upper part of this State, but in Pennsylvania and Virginia. The weather, as I before observed, was extremely cold in the months of January and February. It did not much moderate, nor did the snow begin to dissolve until March, and so gradually was it carried off, that the waters of the rivers and creeks did not rise *above* their banks, although they were *full bank high*, and continued so for a much longer period than they generally do. This is another important fact, relating to the influence, or rather effects of high and overflowing water on the inhabitants residing near thereto, in producing disease, and of which I shall make due use.

The vernal rains began about the latter end of March. They continued generally throughout April. The weather in the first week of May was clear; the second proved a wet one, and a considerable quantity of rain fell in that month at different times. *The rains, although almost continual, never fell in large quantities at a time.* Thus the water courses could always empty themselves rapidly enough to prevent overflowing, except in such as penetrated hilly and uncultivated tracts of ground, from which the rains rapidly descended, and which being not properly in cultivation, did not absorb as much as cultivated ground does.

About the 20th or 25th of June we had clear weather for some days, but in the high parts of the country there fell a vast quantity of rain. In Virginia, and the lower portion of this State, it was the same. The Potowmac, dividing the two States, the rivers and creeks on the south-side of it, and those on the north side, below the falls, were raised to a height which had never been known *at that season of the year* by the oldest liver on their courses. The water, however, did not lay long; it rose rapidly, and as rapidly declined. On the Potowmac, the bottoms were inundated, and immense quantities of corn, rye, tobacco, hay, and rails, were destroyed and swept away. In the interior of the county, almost all the first crop of hay, both timothy and clover was lost; which, although cut generally in clear sun-shining weather, was dtowned in the rain before it could be dried and secured. It would be almost incredible to relate the quantities of this produce which was thus lost and suffered to lay and run into a putrefactive state. Nor was the loss confined to a particular place or neighbourhood. *It was general*; as the nature of the case was the same every where, inasmuch as one season

alone was fitted for mowing the grass, when it was in a proper state for being converted into hay, and every farmer was obliged to endeavour to embrace that season. I was told, that in a single meadow there were lost from twenty to thirty tons of hay. Whenever it lay thus injured, it effectually destroyed vegetation under it; and, to save the second crop of grass, the farmers were obliged to haul it out of their meadows. What an immense mass, a hot-bed, where infectious effluvia must arise, did not this damaged hay form!

Vegetation of all kinds, and fruits of every species, were superabundant this year. Physicians and others predicted, that owing to the great plenty of fruit, the use of which, when quite ripe, is supposed to be not only innocent, but salutary, the year would be healthy. This, like an opposite prediction of the preceding year, was erroneous. The plentifulness of fruit may have had some agency in good effect this far, that the children, in the early weeks of the summer months, were not so much subjected to attacks of cholera as in former seasons. But I shall hereafter mention, that they suffered most materially in the reign of the epidemic, even to the most tender age, and that it frequently affected them fatally. As to adults, and the aged, the sequel will show, that an abundance of fruit did not exempt them from the most mitigated attack of the bilious epidemic, much less did it secure to them the blessings of health. So liberally did the fruit trees produce, that there was scarcely an orchard but what contained a number of trees entirely broken down; and scarcely a tree which had not several limbs snapped off by the weight of its fruit. Every species of fruit was alike favoured by the fertilizing weather.

In the early part of the year, our farmers had every prospect of being blessed with exuberant crops of every kind which was merchantable. They enjoyed every pleasing hope of making their living comfortable, and enriching their coffers. But so fertilized was their soil, by the rain and the sun alternately, that it produced *too* much, and with the much wanted grain generated also a mass of vegetable matter which sprung up, grew, wasted, and perished, forming a body for the powerful sun to act upon, volatilize, and raise into the air, pregnant with the principle of disease and death.

The wheat, in former years, in our country, in most places, weighed generally from sixty to sixty-four pounds, and sometimes exceeded this; but we find that the wheat of the last harvest rarely exceeds fifty-six pounds. This shows, in a striking

manner, the effects of too much wetness upon the grain; it produces more and larger stalks it is true, but loses in the size of the head, the number of grains, and the weight. It was a common thing to observe fields in which the wheat looked well, that is, tall, thick standing, and even full in the head for a short time before harvest, yet, when it came to be cut and examined, or threshed, the deception was discovered.

(To be continued.)

ARTICLE VI.

The superior Advantage of TAPPING at the Navel, illustrated by a Case communicated to Dr. MILLER, by ENNALLS MARTIN, M. B. of Easton, (Maryland) December 15, 1804.

PARACENTESIS, or tapping, is an operation generally considered the most simple and easy of all others in the art of surgery; and yet, I will venture to assert, there are few operators who have not felt some embarrassment in cases of ascites, as to the safety of performing this most simple operation. The physician and surgeon, in all such embarrassing cases, may console himself in this way: the case is a desperate one; the patient can, at all events, live but a short time, and perhaps the operation may hasten his end; as it is well known, its effects are not always to be guarded against by the most skillful; and though relief may be afforded, it can be only temporary. This is a very improper mode of reasoning, not to say cruel and inhuman. *Few and evil are the days of man.* To correct and lessen the evils of human life, is the duty of every individual; but that of a physician and surgeon is to lessen or relieve altogether the distresses of man arising from disease, and to preserve his life to the utmost span. Though the cause of disease cannot be removed, the pain and distress may be much alleviated, and life made comfortable a few weeks, months, or years, to the great consolation of friends and relatives. To the physician and surgeon it must afford no small satisfaction that he has done the utmost that could be done to relieve his patient; and that he has not stumbled upon the wrong method, when there was a right one untried. I consider the following case in point to the

above observations, and to the superior advantage of tapping at the navel.

Mrs. H. M. H—— was my patient twenty-one years ago. I knew her well, and have a pleasure in bearing testimony to her good sense, amiable qualities, and domestic virtues. When a child, she had suffered a small distortion in her spine, which grew with her growth, though it never could be said to have affected her general health. She married at the age of twenty-five years, and bore four healthy fine children, all of whom are now living. Some time previous to her marriage, she became affected with a pulmonic disease, which seemed to be so much fixed, as to excite a general belief among her friends, that she was consumptive. With much truth may it be asserted, the lancet was the sole means of preserving her life; of which she was so much convinced, that she always avowed herself a friend to the *depleting system*, though she had, for many years, outlived the use of it.

About this time two years, in the forty-fifth year of her life, the menses had stopped, and the abdomen began to swell, which induced her to think all was not right; but from the banter of her friends, and feeling no unusual indisposition, she was induced to think with them, that she might be pregnant, though the symptoms attendant on this occasion were not altogether such as she had formerly experienced. As she gradually increased in size from November to April, with gradually declining health, and several tumours beginning now to be perceptibly felt in the abdomen, she, as well as her friends, became concerned about her situation. Dr. Johnson was applied to, who expressed doubts, and desired that I might be called in consultation. We were both decidedly of an opinion her case was an ascites, accompanied with encysted tumours, and perhaps some of the viscera so much enlarged, particularly the omentum, as to make it difficult to distinguish the one from the other.

Under an impression that the disease proceeded from visceral obstructions, as well as a general vitiated habit, we began on a mercurial course, aided with the most powerful diuretics, such as fol. digit. purp. but to our surprise we found the old fashioned sal. nit. more beneficial. Besides these capital remedies, others were used as symptoms seemed to require. As soon as the system was properly charged with mercury, absorption commenced, the abdomen subsided, and we had, in some measure, very pleasing prospects before us, as her general health was much mended: but those tumours, which

were only felt by hard pressing on the walls of the abdomen before the water was absorbed, were now plainly seen as well as felt, and probably had increased rather than diminished in size. She now walked about the house, and occasionally rode out in a close carriage: but alas! as was expected, these pleasing prospects were of short duration. The abdomen began to swell. The same remedies were pushed to the utmost extent, but in vain. The fluctuation of water was more sensible to the touch than for months before; and the tumours were scarcely perceptible without hard pressing with the fingers. In short, the distention of the abdomen became very distressing and painful. No other alternative seemed now to remain than to attempt a perforation of the abdomen, and to draw off its contents. She herself was anxious for tapping, or any thing which could afford her some respite from constant anxiety and pain. We were fully impressed that the operation ought to be performed; but the fear of wounding these *tumours*, which might not be hydatids, but an enlarged omentum, or some other *viscera*, put us to a stand. At length, finding nothing could be gained by delay, but that every thing was to be apprehended from it, we determined that the *tumours* should be shoved towards the navel, and that an incision should be made through the skin with a lancet, exactly half way, by *measurement*, between the navel and the spine of the os ilium, and that then the trocar should be cautiously introduced through the incision into the cavity of the abdomen. This plan was put into execution on the 29th day of October, 1803, without the least injury or accident, and ten pints only of a gelatinous fluid were evacuated, partly through the canula, and more through the wound between the canula and lips of the wound. After the evacuation of the fluid she was a little fainty, and complained of an uneasy painful sensation through the bowels; all which, in the space of an hour, went off, and she felt much relieved for several days, particularly from the painful distention of the abdomen, and a disposition to eject her aliment, which had been a constant attending symptom from the time the abdomen began to swell, and its contents to press upon the stomach.

In the course of a week, the abdomen began gradually to distend with water again, and, at the end of a fortnight it was evidently more enlarged than before she was tapped, and was equally, if not more painful, which obliged us to think of a second operation. The wound was not yet healed, and had rather the appearance of an ill-conditioned sore. Her situation

would not admit of delay, and we had to fix on a spot as near to that first operated on as possible, as well as to avoid several blue veins thereabouts. On the 23d of November, the second operation was performed with the same caution, and twenty pints of water were drawn off, to her inexpressible relief, though, as before, she was sick and fainty. Now, as repeatedly before, diuretics, tonics, &c. &c. were prescribed, as well to keep up the appearance of doing something, as to prevent the accumulation of water, but to no purpose; the sufferings of our patient were daily increasing, and nothing less than a speedy evacuation of the contents of the abdomen held out a prospect of relief. Notwithstanding she possessed more than the usual fortitude of her sex upon all such trying occasions, a dread had seized her mind, and nothing but extreme pain could have induced her to submit to the operation. The first wound now looked worse than when the second operation was performed, and the second had a bad appearance, and we had to choose a spot between, and a little above the two first wounds. On the 7th of the following month (December), she was again tapped with great caution, but with the most alarming consequences. Syncope took place, and we had the dreadful mortification of thinking our patient was expiring under our hands. However, we were soon relieved from our consternation, by her revival, and though a small quantity of water was evacuated, she was much relieved, after experiencing considerable pain through the abdomen for two hours.

Every thing now proceeded as before for a fortnight; that is, in the course of a week, the abdomen gradually enlarged, with increasing pain from distention, and the usual ejection of food from the stomach. Nothing remained that afforded a chance for relief, but a discharge of the contents of the abdomen. We were loth to hazard the same result, or perhaps inevitable death. The navel had presented itself distended almost in diameter an inch. We reflected, that the only barrier between us and the contents of the abdomen was a little thin distended skin, cellular membrane hardly perceptible upon dissection, and the peritoneum stretched to nothing; and though this perforation through the linea alba, by the umbilical cord, should not be so large as it appeared to be by distention, there could not much injury arise from cutting a little upon the linea alba itself; at all events we should meet with no veins or arteries to plague us, and if we should cut this tendinous substance, it would probably heal as soon as the first wound by the trocar; but when our patient was told, that no other instru-

ment was to be used than the lancet, and that this practice was sanctioned half a century ago, by an old and celebrated surgeon, Mr. Sharpe, she readily assented to it, notwithstanding we candidly acknowledged we had never performed the operation in that way, nor seen it performed by others. It must be confessed, we had some scruples ourselves on this occasion, because we could not find, by the most diligent research, that the more modern improvements in surgery had authorized this mode of tapping. However, the dread of our patient, as well as our own apprehensions of the consequences, judging from the effects of the last operation, determined us to deviate from the beaten track of half-way *measurement*. With some degree of confidence, she was laid partly on her side, and with a common lancet, a puncture was made through the navel, with as much, if not more ease, than a vein could have been opened in the arm. The water flowed in a stream, fully as large as a goose quill, while our patient expressed her surprise and satisfaction, declaring she was scarcely sensible that any thing had been done. "Bless me," said she, "why did you not try this method before? I shall never be under such dread again! I feel easier already!" It appeared as if less pressure was necessary to evacuate the waters, and what seemed very unaccountable, she experienced hardly any of those uneasy painful sensations which had been consequent on all the previous operations. As soon as the water ceased to flow, the lips of the wound closed together, and healed by the first intention in two days, by no other application than that of dry lint, and a plaister of basilicon.

Though now her health began to improve, and all the symptoms to wear a more favourable aspect, she was regularly tapped in this way once every fortnight, with the certain prospect of relief, losing each time from sixteen to twenty-two pints of water, until some time in April, 1804, when we began to date a gradual declension in her general health; a decrease in the quantity of water drawn off each time, and a perceptible increase in the size of the hydatids, from whence there was a more constant compression on the stomach, and, of course, less aliment lay there to answer the purposes of nutrition. Her flesh was very sensibly wasting away, and though we continued to repeat the operation every fortnight, less benefit was obtained, and less water evacuated each time. What was very distressing to herself, as well as painful to us to observe, after drawing off all that could be pressed out, her size was scarcely diminished. Finding that the benefits arising from

tapping would soon be at an end, unless the contents of the hydatids could be emptied, we now began to turn our attention to that desirable object, somewhat aware of danger, and apprehending difficulties from their probable consistence. Reflecting that time was pressing hard upon us, and that none was to be lost, we determined, with the approbation of our patient and her friends, to tap as usual at the navel, and while the waters were flowing, to examine with a probe one which lay directly over that part, and then, if advisable, to perforate it with the trocar. Every thing appearing plain, and without hazard, I introduced the trocar through the puncture, and pushed it into the hydatid, then withdrew the perforator, which was followed slowly by a white gelatinous substance, which seemed to hang from the canula, and, in a little time, to cease to flow at all, which induced us to take hold of it with our fingers, and to pull at it. The canula was withdrawn, and again introduced, but all to no purpose. The air had coagulated this tough viscid matter, and made it a perfect gluten, which almost entirely closed up the orifice. The hydatid had come in contact with the internal lips of the wound, and produced a constant oozing of a thin fluid for many weeks, and thus effectually prevented it from healing by the first intention, which it uniformly had done before in forty-eight hours after each operation. Our distress may be readily conceived on this trying occasion, but that of our patient was mortifying in the extreme. She complained most piteously, that we had stopped the only tolerable avenue to a temporary relief! For five or six months she had enjoyed some comfortable days, but now, alas! she was suddenly deprived of all hope of even a temporary nature! Let it not be supposed this amiable lady was so much attached to life as to indulge an unreasonable hope. She had that natural desire, which inhabits the breast of every human being, of living free from pain. She had also endearing connections, and would willingly have spun out the tender thread of life a little longer; but, at the same time, she had too much good sense and reflection not to know that she had, for a long time, been hastening to that "bourn from whence no traveller returns." Patience and resignation had to her become habitual virtues; but when pain and affliction were constantly accumulating, it was natural to desire and to seek for relief.

Though we had now done what we thought would, probably, have been most conducive to the prolongation of the life of our patient, we were convinced we had taken a wrong step to effectuate that desirable object, and what was also very

mortifying, we extracted only a few pints of water, not half the quantity which might have been drawn off, if we had not been so anxious to do more than heretofore. We shall certainly stand excused for going thus far, when it is considered that all the animal functions had almost entirely lost their energy, and scarcely a spark of the vital principle was remaining, that was not oppressed by what we wished to remove. If we could have succeeded in our grand design, we certainly should have arrested the strong arm of death a few months longer, though it must be obvious our efforts could not have prevailed against the power of disease.

From the last date, to the sixth of July, we remained little more than idle spectators of a scene, which we could only lament, and administered palliatives, which were constantly rejected by that organ, from which the animal system receives all its supplies of nourishment and strength. She now begged us to try any method to give some temporary respite from pain which had become more aggravated. Accordingly, on the sixth day of July, we ventured the sixteenth time on the spot, where we had set out from on the 29th day of October, 1803. But, alas! the waters were too gelatinous to flow, or were enveloped in their own membranes, forming hydatids, which we were, by former experience, warned from meddling with. At most we did not obtain more than five or six pints of a gelatinous fluid. Our labours were now at an end, and the *last enemy* our afflicted patient had to contend with *was death*, which cut the tender thread of life on the second day of August, 1804.

ARTICLE VII.

CASE of NECROSIS of the TIBIA of the RIGHT LEG: Communicated by Dr. ELOY BERGER, of New-York, to Dr. MILLER.

IN the month of April, 1803, I was called upon, in the absence of M. Delmas, my colleague, by Mr. R. Kemble, to attend one of his servants, who had been laid up with a sore leg nine or ten months, and had used various kinds of treatment and application without any success. Mr. Kemble, feeling very much for the unfortunate man, requested me to inspect his leg with great attention, that I might give him my opinion

about the nature of his complaint. Upon the first inspection of the leg, I found it considerably swollen, from the tuberosity of the tibia, down to three inches above the articulation of the ankle; the swelling affected the anterior part of the leg; it was very hard, and seemed to be formed by a bony substance; several ulcerations were spread over its surface. At the first sight I suspected it to be a Necrosis; but to ascertain it, I examined, with a small probe, all the ulcerated part, and, upon due inquiry, I found divers fistulas, into which I introduced the probe to discover their depth in the bone. One of them, which was a little below the tuberosity of the tibia, was more than an inch deep, and two or three others in the same direction below that had about the same depth. By this examination I was convinced that every fistula had a communication with the centre of the bony cylinder. The interval between the upper and the lower fistula was about four inches. From these inquiries, I entertained no uncertainty about the nature of the complaint; I assured Mr. K. that his servant had a necrosis, which could not be cured but by a surgical operation. He immediately wished to have him committed to my care, and that of M. Delmas, who had already been very useful to the patient on occasions which had preceded the formation of this complaint. On my return from Mr. K.'s country seat, I communicated to M. Delmas my opinion concerning the nature of the disease, assuring him that I was certain that a piece of bone was separated in the centre of the bony mass supporting the leg, and which could not be extracted but by the removal of a sufficient portion of the bone forming the case in which it was confined. I consequently proposed to him the operation which I had before performed several times. He agreed with me, and a few days after we performed it.

To have the patient more at hand, he came into New-York, to Mr. Peter Kemble's, where, after the usual preparation, we performed the operation in the following manner. We made, at first, two half-elliptic incisions, in which we included all the fistulas. These incisions were begun a little below the tuberosity of the tibia, and ended together about half an inch lower than the last fistula. We held, with a small forceps, the upper extremity of the incised skin, and dissected it downwards in its totality. By that process, the bone was laid bare five inches in length, and three in breadth. After having washed away, with a sponge, the blood which covered its surface, we perceived it not to be even as the tibia is commonly, but uneven and rough. We then cut off, with a gouge and a mallet, many

pieces of the bony substance, that we might reach the middle of the cylinder, in which we supposed the disease to exist. With much patience and courage we attained it, and forthwith we discovered a piece of bone, much whiter than that which we had been obliged to cut off in order to discover it. Having taken hold of it with the forceps, we perceived it to be loose, and that it was only necessary to lay it entirely bare to extract it easily. We then persisted in cutting off with the gouge and mallet, the whole thickness of the bony mass which kept it confined, down to the lower fistula; and notwithstanding our being retarded in the operation by the discharge of blood, which we were constantly obliged to wash away with the sponge, we laid bare in twenty minutes the whole of the detached piece of bone. Its extraction was then the easier, as it had no other adhesion to the sound parts but by the crossing of the angles of each other. After this operation, we washed the blood out of the bony cavity, and cleared away the matter with which it was filled. We made round the sharp angles which were in it, we filled it with dry lint, and secured the whole by compresses and a bandage.

Afterwards we examined this piece of bone: it was four inches in length, and contained in its upper extremity the three substances of the bones: it was white, and smooth, and much harder than the pieces which we had cut off in order to reach it.

One might be surprised at the patient having not, during all the time of the operation, which lasted more than twenty minutes, uttered a single expression of pain; we even observed that he had made no complaint but during the incision of the skin. Four days after the operation, the suppuration of the wound began to be established, without the patient having had any fever: he had taken nothing during that time but some lemonade for his drink, and some soup for his food. At first, I dressed the wound with small dossils, imbued with vulnerary water, which was employed to promote the filling up of its cavity: I covered them with a pledgit of lint, over which I laid a poultice of bread and water, and kept the whole secure by a bandage. The same dressing was continued for a long time without any alteration. Hardly were ten days elapsed before I perceived many fleshy granulations, arising all over the bony surface, which would have soon filled its cavity, had I not opposed their increasing, by the interposition of the small dossils, and a slight compression made upon the wound: this restriction kept down fungous flesh, and seemed necessary, in order to keep the sore in a state of firmness and moderate inflammation, which

is necessary for a good suppuration. In this manner, the pus, during all the time of my attendance, was white, entirely inodorous, and the ulcer drawing very fast to a cicatrization. The dressing was constantly the same, except that I laid aside the vulnerary water to use only dry lint, and lessened the dossils in proportion to the diminution of the cavity of the ulcer. In short, four months after the operation, it was perfectly healed.

From my inquiries to discover the cause of this disease, I was informed that the patient had been affected some time before with an inflammatory rheumatism; that the humour having fixed upon the right leg, a considerable swelling ensued, and that several abscesses had, after very long sufferings, been the result of it. Such is the information I was able to obtain about the cause of this complaint.

Reflexions on this Case.

From the information just mentioned, and the nature of the complaint, is it not natural to think, that one of the abscesses which affected the leg, took its seat between the periosteum and the bone? that the pus formed between those two parts, necessarily destroyed the vessels of communication between them? that those vessels which are destined to convey into the bone the materials of nutrition being destroyed, those materials, instead of reaching the place of their destination, remained in the periosteum, spread in the different meshes with which it is framed, and formed a bony production, the configuration of which was necessarily that of the membrane which formed its mould? But, what could have become of the part of the bone laying under it? Receiving no longer the aliment of its reparation, it must have perished and fallen into mortification—certainly it must; and it is on that account, that provident nature had begun the bony production to repair the loss she was sustaining: the one seems even to have been formed, whilst the other was falling into ruin. Whoever examines attentively this disease, will acknowledge that course of nature in its formation. But it is obvious, that it is not sufficient for her to have thus repaired the loss she sustains; but she must, besides, get rid of the piece of the bone fallen into mortification, and that part of her task is not the easiest to perform; it is in fact the more difficult, as the piece of bone is confined in a kind of case; yet the difficulty does not stop her. That wise and powerful mother finds remedies even in the most difficult cases, and if she do not succeed always in fulfilling her design, an attentive observer perceives, at least, that she neglects nothing

to accomplish it. This is the way which she employs in that occurrence to get rid of the detached body, whose presence is troublesome to her. Wise in all her operations, that body is the agent she makes use of to obtain a vehicle proper to convey it out: it is, in fact, its presence, which, by irritating the internal part of the case in which it is confined, determines in it a more or less abundant suppuration; the matter produced soon makes several holes through the bony case, and then pierces the skin to find vent. But as the pus, before its evacuation, lies in contact, during a certain time, with the detached piece of bone, it separates, by a kind of maceration, some small particles of it, which it conveys continually out, and would succeed, in time, in carrying off the whole of the disease if circumstances were not unfavourable.

But it is easy to perceive that these efforts, however wonderful, must often prove insufficient to procure a perfect recovery, when the detached piece of bone is considerable. Nature is too slow in her operations, and the patient often falls away before the accomplishment of her design: then it is the part of our art to make up for the weakness of nature, and to furnish the means she wants; she has traced out what must be done; she has fulfilled her task—the surgeon must fulfil his. Armed with a gouge and a mallet, he must then cut off, as we have done in the case above, a part of the bony cylinder which conceals the disease, in order to be able to extract it easily. In that manner our art performs, in a few minutes, what nature could not do in several years; it prevents many severe occurrences, which always attend, in process of time, this distressing disease, and which, if they do not bring the patient to the grave, at least necessitate an amputation, always painful, and often fatal. We can assert, that four patients upon whom we have practised this operation, have suffered no unfavourable consequences in the warm climates, where tetanic affections very often follow the great operations.

 REVIEW.

ART. I. *Flora Boreali-Americana, sistens Characteres Plantarum, quas in America Septentrionali collegit et detexit ANDREAS MICHAUX, Instituti Gallici Scientiarum, nec non Societatis Agriculturæ Caroliniensis Socius. Tabulis æneis 51 ornata. Tom. i. pp. 330, tom. ii. pp. 332. 8vo. Parisiis, Crapelet, et Argentorati, Levrault. 1803. i. e. The North-American Flora, containing the Characters of such Plants as were collected and discovered in North-America, by ANDREW MICHAUX, Member of the French Institute, and of the Agricultural Society of South-Carolina. Embellished with 51 Copper-plates, in two vols. 8vo. Paris and Strasburgh. 1803.*

BEFORE the revolutionary struggle began in France, Louis XVI. had patronized a botanical inquiry into the vegetable productions of North-America. In our *Hexade* i. vol. vi. p. 64, we gave an account of the establishments formed for that purpose, and of the *History of the Oaks of North-America*, published by Mr. Michaux, the botanist employed by that monarch. Since that work on the *Quercus*-family was published, the great performance of Mr. M. on the vegetables of that extensive country generally, has made its appearance. We announced the publication of it in our *Hexade* ii. vol. i. p. 97.

The industrious author of this work had spent six years in Persia before his mission to America. He afterwards passed twelve years in exploring the regions between Hudson's Bay and Carolina. In the course of the numerous excursions he made during that time through the diversified States, Provinces, and Territories, he collected the materials of this new and more complete synopsis of North-American plants. This, he hopes, will be found to be the case, notwithstanding the prior descriptions of the plants of Canada, by CORNUTI; of Virginia, by CLAYTON, aided by GRONOVIVS; of Carolina, by CATESBY, with plates, as well as by WALTHER and BARTRAM; and of the more northern parts, by MARSHALL and FORSTER.

This work is published by the author's son, the father having left it in his hands rather unfinished, when he set off on his late voyage of discovery to the islands lying in the great South Sea. We mention, with concern, the death of

this indefatigable naturalist in 1802. He fell a victim to the zeal with which he urged his physical inquiries on the coast of Madagascar.

The author follows the Linnæan, or Sexual system. In addition to the vegetables, which are indigenous in America, he has also noted the European plants growing there. The generic characters are chiefly taken from Murray's last edition of the system of vegetables. Mr. Michaux seems to have confirmed as many of the Linnæan species as he could; though, for the sake of perspicuity, he has described some of them over again. It is affirmed, that the work contains no species that have not either been seen or gathered by Michaux himself. This must give to this Flora great value, and render it peculiarly interesting to the lovers of Botany in the United States. Genuine descriptions recently made of the plants of the country by an actual observer, possessing remarkable skill and discernment in the practical as well as the theoretical parts of the science, cannot fail to increase the facility of its acquirement among our studious youth. To them, in particular, it will shorten the way to knowledge, and, at the same time, render it much more easy and delightful.

Particular labour has been bestowed upon the *Cyperaceæ* and *Gramineæ*; and all the *Cryptogamia* have been sedulously attended to, except the *fungi*. As respects the *Filices*, he adopts the arrangement of *J. E. Smith*; on the *Musci*, the system of *Hedwig*; and he follows the method of *Acharius* on the *Lichens*. Care has been taken that the genera of the same order should be assembled under the banner of affinities, and thrown into sections as far as the laws of the system would permit; so that they may be found by the inquirer and student with the greater readiness and ease.

We consider this *Flora Boreali-Americana* as a most desirable addition to the Natural History of our country. With this work in his hand, the botanist will be enabled to pursue his studies on the vegetables of Fredon, and the adjoining regions, with additional ease and success. Though we cannot dismiss it from our notice, without expressing our regret that the author had not enriched his book with some of the synonyms from other writers, with some of the popular and trivial names, and with some little sketch of the dietetic, medicinal, and economical uses of the more distinguished species. In its present form, it has too much the aspect of a mere descriptive catalogue, or dry technical nomenclature.

ART. II. *The History of Mexico, &c. &c.* By Abbe D. Francesco Saverio Clavigero.

[Continued from p. 290.]

IN the enumeration which the author has given of the minerals, plants, and animals of Mexico, we regret that he has employed popular terms only, and not introduced the significant and appropriate language of science. On this account his descriptions, though spirited, and in some instances accompanied by prints, are less clear and intelligible than could be wished. The great botanist of this region is HERNANDEZ, who, in his *Historia Naturalis Novæ Hispaniæ* has described some hundreds of its native plants, chiefly of the medicinal kind. There are many more not included in this writer's great work. But the new world contained not, at the time of its discovery, either water-melons, apples, peaches, quinces, apricots, pears, pomegranates, figs, black-cherries, almonds or olives. It contained some species of walnuts, chesnuts and grapes; other sorts have been imported. The cocoa was brought from the Philippine Islands; and the plantain, citron, orange and lemon, from the Canaries. The pine-apple, and a great variety of other tropical fruits, were unquestionably indigenous. Vanilla, cotton and rocou, were also native vegetables. From Europe were brought wheat, barley, rice, peas and beans. Maize was the favourite bread-corn of the Mexicans, and several varieties of it grew spontaneously in their land. But turnips, radishes, carrots, garlic, lettuce, cabbage and asparagus, were brought from Europe; though Cortez mentions in one of his letters to Charles V. that onions were sold in the markets of Mexico when he arrived there, so that they are probably natives.

After writing at large on the palms and timber trees of Mexico, Mr. C. thus describes the tree which affords the balsam of Meccha, and that other from which elastic gum distils. Vol. i. p. 42 and 46.

“The Huitziloxitl, from which a balsam distils, is a tree of moderate height. Its leaves are something similar to those of the almond tree, but larger; its wood is reddish and odorous, and its bark grey, but covered with a reddish pellicle. Its flowers, which are pale, spring from the extremity of the branches. Its seed is small, white, and crooked; and likewise comes from the extremity of a thin shell about a finger long. In whatever part an incision is made, especially after rains, that

excellent resin distils which is so much valued in Europe, and nowise inferior to the celebrated balsam of Meccha.* Our balsam is of a reddish black, or a yellowish white, as from an incision it runs of both colours, of a sharp and bitter taste, and an intense but most grateful odour. The balsam tree is common in the provinces of Panuco and Chiapan, and in other warm countries. The kings of Mexico caused it to be transplanted into the celebrated garden of Huaxtepec, where it rooted successfully, and multiplied considerably in all those mountains. Some of the Indians, to extract a greater quantity of balsam, after making an incision in the tree, have burnt the branches. The abundance of these valuable trees makes them regardless of the loss of numbers; by which means they are not obliged to wait the slowness of the distillation. The ancient Mexicans not only collected the opobalsam, or drop distilled from the trunk, but also extracted the xylobalsam from the branches by means of decoction.† From the Huaconex and Maripenda,‡ they extracted an oil equivalent to the balsam. The Huaconex is a tree of moderate height, and of an aromatic and hard wood, which keeps fresh for years though buried under the earth. Its leaves are small and yellow, its flowers likewise small and white, and its fruit similar to that of the laurel. They distilled oil from the bark of the tree; after breaking it, keeping it three days in spring water, and then drying it in the sun. They likewise extracted an oil from the leaves, of a pleasing odour. The Maripenda is a shrub, whose leaves are like the iron of a lance; and the fruit is similar to the grape, and grows in clusters which are first green, afterwards red. They extracted the oil, by a decoction of the branches, with a mixture of some of the fruit.

“The *Elastic Gum*, called by the Mexicans *Olin* or *Olli*, and by the Spaniards of that kingdom, *Ule*, distils from the *Olquahuil*, which is a tree of moderate size; the trunk of which is smooth and yellowish, the leaves pretty large, the flowers white, and the fruit yellow and rather round, but an-

* “The first balsam brought from Mexico to Rome was sold at one hundred ducats, by the ounce, as Monardes attests in his History of the medicinal simples of America, and was declared by the Apostolic See, matter fit for chrism, although it is different from that of Meccha, as Acosta and other writers on America observe.”

† “There is an oil also drawn from the fruit of the *Huitziloxitl*, similar in smell and taste to that of the bitter almond, but more acrimonious and intense, which is found highly useful in medicine.”

‡ “The names *Huaconex* and *Maripenda* are not Mexican, but adopted by the authors who write of these trees.”

gular; within which there are kernels as large as filberds, and white, but covered with a yellowish pellicle. The kernel has a bitter taste, and the fruit always grows attached to the bark of the tree. When the trunk is cut, the Ule which distils from it is white, liquid, and viscous; then it becomes yellow, and lastly of a leaden colour, though rather blacker, which it always retains. Those who gather it can model it to any form, according to the use they put it to.

"The Mexicans made their foot-balls of this gum, which, though heavy, rebound more than those filled with air. At present, besides other uses to which they apply it, they varnish their hats, their boots, cloaks, and great coats with it, in the same way as wax is used in Europe, which makes them all water proof: from Ule, when rendered liquid by fire, they extract a medicinal oil. This tree grows in hot countries, such as Ihuallapan and Mecatlan, and is common in the kingdom of Guatemala."*

Of quadrupeds, horses, asses, bulls, sheep, goats, hogs, dogs, and cats, were imported from the Canaries and Europe. The author contends, that among the original inhabitants of this country, were lions, tigers, rabbits and rats, but mice were brought thither in ships. We extract his description of the wild hog or Pecari of the south, p. 51.

"The *Cojamell*, to which, from its resemblance to the wild boar, the Spaniards gave the name of Javali, or wild hog, is called in other countries of America *Pecar*, *Saino*, and *Tayassu*. The gland it has in the cavity of its back from which a plentiful wheyish stinking liquid distils, led the first historians of the country, and since them many others, into the mistaken belief that it produced hogs with their navels on their backs; and many still credit the absurdity, although upwards of two centuries are elapsed since anatomists have evinced the error by dissection of the animal. Such is the difficulty of rooting out popular prejudices! The flesh of the *Cojamell* is agreeable to eat, provided it is quickly killed, the gland cut out, and all the stinking liquid cleaned from it; otherwise the whole meat becomes infected."

His account of the other quadrupeds is too long for quotation or abstract. Our readers will find their account in turning to it. The birds of Mexico are reckoned at more than two hundred species. Common fowls were brought from the Ca-

* "In Michuacan there is a tree, called by the Tarascas *Tarantaqua*, of the same species as the Olquahuil; but its leaves are different."

naries by the way of the Antilles, but the Turkey was a native of America. After these latter were carried to Europe they were known by many names; at Bologna they were called *Tocchi*, or *Tocchoni*, whence probably comes our common name of *Turkey*. Many authors allow to the birds of Mexico superior gaiety of plumage, but deny them all excellence in voice and singing. In favour of the music of the feathered tribes of his country, the Abbè thus expresses his sentiments, p. 70.

“Many authors, who allow to the birds of Mexico a superiority in the beauty of their plumage, have denied them that of song: but we can, with perfect confidence affirm, that that opinion has not been formed upon real observation, but has proceeded from ignorance, as it is more difficult for Europeans to hear the Mexican birds than to see them.

“There are in Mexico, as well as in Europe, gold-finches and nightingales, and at least two-and-twenty species besides of singing birds, which are little or nothing inferior to these; but all that we are acquainted with are surpassed by the very famous *Centzontli*, so named by the Mexicans, to express the wonderful variety of its notes*. It is impossible to give any idea of the sweetness and mellowness of its song, of the harmony and variety of its tones, or of the facility with which it learns to imitate whatever it hears. It counterfeits naturally, not only the notes of other birds, but even the different noises of quadrupeds. It is of the size of a common thrush. Its body is white upon the under-side, and grey above; with some white feathers, especially about the head and tail. It eats any thing, but delights chiefly in flies, which it will pick from one's finger with signs of pleasure. The *Centzontli* is to be found every where in great numbers; yet they are so much esteemed, that I have seen five-and-twenty crowns paid for one. Attempts have often been made to bring it to Europe, but I do not know if they ever succeeded: and I am persuaded that, although it could be brought to Europe alive, yet it could not be, without injuring its voice and other qualifications, by a change of climate and the hardships of a voyage.

“The birds called Cardinals, are not less delightful to the

* “*Centzontlatotle* (for that is the real name, and *Centzontli* is but an abbreviation) means the many-voiced. The Mexicans use the word *Centzontli* (four hundred) as the Latins did *mille & sexcenti*, to express an indefinite and innumerable multitude. The Greek name of *Polyglotta*, which some modern Ornithologists apply to it, corresponds to the Mexican name. See further what we say of *Centzontli*, in our Dissertations.”

ear, from the sweetness of their song, than to the sight, by the beauty of their scarlet plumage and crest. The Mexican Calandra sings very sweetly also, and its song resembles that of the nightingale. Its feathers are varied with white, yellow, and grey. It weaves its nest in a wonderful manner, with hairs pasted together with some kind of viscid substance, and suspending like a little bag, from the bough of a tree. The *Tigrillo*, or little Tiger, which is likewise of some value upon account of its music, is so named from its feathers being spotted like the skin of a tiger. The *Cuittlaccochi* resembles the Centzontli in the excellence of its song, as well as in size and colour, as the *Coztototl* exactly does the Canary bird, brought thither from the Canaries. The Mexican Sparrows, called *Corriones* by the Spaniards, are nothing like the real sparrows, except in their size, their manner of hopping, and in making their nests in the holes of walls. Their body is white upon the under-side, and grey upon the upper; but at a certain age the heads of some become red, and others yellow.* Their flight is laborious, from the smallness of their wings, or the weakness of their feathers. Their song is most delightful and various. There are great numbers of these singing birds in the capital, and the other cities and villages of Mexico.

"The talking birds too, or those which imitate the human voice, are to be found in equal abundance, in the country of Anahuac. Even among the singing birds there are some which learn a few words; such as the celebrated Centzontli, and the *Acolchichi*, or bird with the red back, which, from that mark, the Spaniards have called the *Commendador*. The *Cehuan*, which is bigger than a common thrush, counterfeits the human voice, but in a tone that appears burlesqued, and will follow travellers a great way. The *Tzanahuei* resembles the magpie in size, but is of a different colour. It learns to speak, steals cunningly whatever it can get, and in every respect shows a kind of instinct superior to what we generally observe in other birds. But of all the speaking birds, the parrots hold the first place; of which they reckon, in Mexico, four principal species, namely, the *Huacamaya*, the *Toznenetl*, the *Cochotl*, and the *Quiltototl*."†

* "I have heard it said, that the *Corriones* with red heads are the males, and those with yellow heads the females."

† "The *Toznenetl* and *Cochotl* are called by the Mexican Spaniards, *Pericos* and *Loros*. The word *Huacamaya* is from the Haitinian language, which was spoken in Hispaniola. *Loro* is from the Quichoan or Incan, and *Toznenetl*, *Cochotl*, and *Quiltototl* from the Mexican."

The author, under the head of insects, gives a circumstantial account of the luminous beetle which shines so brightly in the dark, as to enable a person to travel, and even to read by its light. Among the six species of bees, which are indigenous, he says the honey-bee is one. That curious inquirer, Dr. Belknap, has shown, in one of his able memoirs, that though this may be true of Mexico, the honey-bee of the more northern regions was certainly brought from Europe. The cochineal insect, he says, is peculiar to the land of Anahuac, but his account of it is too long for us to extract.

It is affirmed, positively, that the black vomit was unknown in Vera Cruz, and every other part of Mexico, before the year 1726. That distemper of course (if this very questionable fact be admitted on the assertion of the author) did not afflict the aborigines. The proficiency of the natives in the art of medicine is thus described, vol. ii. p. 244.

“Amongst other arts exercised by the Mexicans, that of medicine has been entirely overlooked by the Spanish historians, although it is certainly not the least essential part of their history. They have contented themselves with saying, that the Mexican physicians had a great knowledge of herbs, and that by means of these they performed miraculous cures; but do not mark the progress which they made in an art so beneficial to the human race. It is not to be doubted, that the same necessities which stimulated the Greeks to make a collection of experiments and observations on the nature of diseases, and the virtue of simples, would also have in time led the Mexicans to the knowledge of those two most important parts of medicine.

“We do not know whether they intended by their paintings, like the Greeks by their writings, to communicate their lights to posterity. Those who followed the profession of medicine instructed their sons in the nature and differences of the diseases to which the human frame is subject, and of the herbs which Providence has created for their remedy, the virtues of which had been experienced by their ancestors. They taught them the art of discerning the symptoms and progress of different distempers, and to prepare medicines and apply them. We have ample proofs of this in the natural history of Mexico, written by Dr. Hernandez.* This learned and laborious writer had

* “Hernandez, who was physician to Philip II. king of Spain, and much renowned for the works he published concerning the Natural History of Pliny, was sent by that monarch to Mexico, to study the natural history

always the Mexican physicians for his guides in the study of natural history, which he prosecuted in that empire. They communicated to him the knowledge of twelve hundred plants, with their proper Mexican names; more than two hundred species of birds; and a large number of quadrupeds, reptiles, fishes, insects, and minerals. From this most valuable, though imperfect history, a system of practical medicine may be formed for that kingdom; as has in part been done by Dr. Farsan, in his book of *Cures*, by Gregorio Lopez, and other eminent physicians. And if since that time the study of natural history had not been neglected, nor such a prepossession prevailed in favour of every thing which came from beyond the seas, the inhabitants of New Spain would have saved a great part of the expenses they have been at in purchasing the drugs of Europe and of Asia, and reaped greater advantages from the productions of their own country. Europe has been obliged to the physicians of Mexico for tobacco, American balsam, gum copal, liquid amber, sarsaparilla, tecamaca, jalap, barley, and the purgative pine-seeds, and other simples, which have been much used in medicine: but the number of those of which she has been deprived the benefit by the ignorance and negligence of the Spaniards, is infinite.

"Among the purgatives employed by the physicians of Mexico, besides jalap, pine-seed, and the small bean, the Mechoacan, so well known in Europe,* was extremely com-

of that kingdom. He employed himself there with other able learned naturalists for several years, assisted by the Mexican physicians. His work, worthy of the expense which it cost of sixty thousand ducats, consisted of twenty-four books of history, and eleven volumes of excellent figures of plants and animals; but the king thinking it too voluminous, gave orders to his physician Nardo Antonio Ricchi, a Neapolitan, to abridge it. This abridgement was published in Spanish by Francisco Ximenes, a Dominican, in 1615, and afterwards in Latin, at Rome, in 1651, by the Lincean academicians, with notes and learned dissertations, though rather long and uninteresting. The manuscripts of Hernandez were preserved in the library of the Escorial, from which Nuremberg extracted, according to his own confession, a great part of what he has written in his Natural History. F. Clau de Clement, a French Jesuit, discoursing of the manuscript of Hernandez, says thus: "Qui omnes libri, & commentarii, si prout affecti sunt, ita forent perfecti, & absoluti, Philippus II. & Franciscus Hernandius haudquaquam Alexandro, & Aristoteli hac in parte concederent."

* "The celebrated root of Mechoacan is called *Tacauebe* by the Tarascas, and *Tlalantlacuitlapilli* by the Mexicans. The knowledge of it was communicated by a physician of the king of Michuacan to the first religious missionaries who went there to preach the gospel; he cured them with it of certain fevers of a putrid nature. By them it was made known to the Spaniards, and from the Spaniards to all Europe."

mon, also the *Izticpatli*, much celebrated by Hernandez, and the *Amamartla*, vulgarly called the *Rhubarb of the Brothers*.

" Amongst other emetics, the Mexicans made use of the *Mexochitl*, and the *Neixcottlapatli*; and among diuretics the *Axirpali*, and the *Axirtlacotl*, which is so highly praised by Hernandez. Amongst their antidotes, the famous *Contrahierba* was deservedly valued, called by them, on account of its figure, *Coanenepilli*, *Tongue of Serpent*, and, on account of its effects, *Coapatli*, or *remedy against serpents*. Amongst their errhines was the *Zozojatic*, a plant so efficacious, that it was sufficient to hold the root to the nose to produce sneezing. For intermittent fevers they generally employed the *Chatalhuic*, and in other kind of fevers the *Chiautzolli*, the *Iztacxalli*, the *Huehuetzonticomatl*, and above all the *Izticpatli*. To prevent the illness which frequently followed too much exercise at the game of the ball, they used to eat the bark of the *Apitzalpatli* soaked in water. We should never finish if we were to mention all the plants, gums, minerals, and other medicines, both simple and compound, which they employed against all the distempers which were known to them. Whoever desires to be more amply informed on this subject, may consult the above mentioned work of Hernandez, and the two treatises published by Dr. Monardes, a Savillian physician, on the medicinal articles, which used to be brought from America to Europe.

" The Mexican physicians made use of infusions, decoctions, ointments, and oils, and all those things were sold at market, as Cortes and Bernal Diaz, both eye-witnesses, affirm. The most common oils were those of ule, or elastic gum, *Tlapatl*, a tree similar to the fig, *Chilli*, or great pepper, Chian, and *Ocotl*, a species of pine. The last they obtained by distillation, the others by decoction. That of Chian was more used by painters than physicians.

" They extracted from the *Huitziloxitl*, as we have already mentioned, those two sorts of balsam described by Pliny and other ancient naturalists, that is, the *opobalsam*, or balsam distilled from the tree, and the *xylobalsam* obtained by decoction of the branches. From the bark of the *Huaconex*, soaked four days continually in water, they extracted another liquor equal to balsam. From the plant called by the Spaniards *maripenda*, (a name taken it appears from the language of the Tarascas) they obtained also a liquor equal to balsam, as much in its odour as wonderful effects, by putting the tender stones of the plant, together with the fruit, to boil in water, until the water became as thick as must. In the same manner they

obtained many other valuable oils and liquors, namely, that of liquid amber, and that of fir.

“Blood-letting, an operation which their physicians performed with great dexterity and safety with lancets of *Itztli*, was extremely common among the Mexicans, and other nations of Anahuac. The country people used to let themselves blood, as they still do with the prickles of the maguei, without employing another person, or interrupting the labour in which they were occupied. They also used the quills of the *Hu-itztlacuatzin*, or Mexican porcupine, which are thick, and have a small hole at their points.

“Among the means which the Mexicans employed for the preservation of health, that of the bath was very frequent. They bathed themselves extremely often, even many times in the same day in the natural water of rivers, lakes, ditches, and ponds. Experience has taught the Spaniards the advantages of bathing, in that climate, and particularly in the hot countries.

“The Mexicans, and other nations of Anahuac, made little less frequent use of the bath *Temazcalli*. Although in all its circumstances it is deserving of particular mention in the history of Mexico, none of the historians of that kingdom have described it, attending more frequently to descriptions and accounts of less importance, so much that if some of those baths had not been still preserved, the memory of them must have totally perished.

“The *Temazcalli*, or Mexican vapour-bath, is usually built of raw bricks. The form of it is similar to that of ovens for baking bread, but with this difference, that the pavement of the *Temazcalli* is a little concave, and lower than the surface of the earth, whereas that of most ovens is plain, and a little elevated, for the accommodation of the baker. Its greatest diameter is about eight feet, and its greatest height six. The entrance, like the mouth of an oven, is wide enough to allow a man to creep easily in. In the place opposite to the entrance, there is a furnace of stone or raw bricks, with its mouth outwards to receive the fire, and a hole above it to carry off the smoke. The part which unites the furnace to the bath, and which is about two feet and a half square, is shut with a dry stone of *Tetzontli*, or some other stone porous like it. In the upper part of the vault there is an air-hole, like that to the furnace. This is the usual structure of the *Temazcalli*, of which we have subjoined a figure; but there are others that are without vault or furnace, mere little square chambers, yet well covered and defended from the air.

"When any person goes to bathe, he first lays a mat* within the *Temazcalli*, a pitcher of water, and a bunch of herbs, or leaves of maize. He then causes a fire to be made in the furnace, which is kept burning, until the stones which join the *Temazcalli* and furnace are quite hot. The person who is to use the bath enters commonly naked, and generally accompanied, for the sake of convenience, or on account of infirmity, by one of his domestics. As soon as he enters, he shuts the entrance close, but leaves the air-hole at top for a little time open, to let out any smoke which may have been introduced through the chinks of the stone; when it is all out he likewise stops up the air-hole. He then throws water upon the hot stones, from which immediately arises a thick steam to the top of the *Temazcalli*. While the sick person lies upon the mat, the domestic drives the vapour downwards, and gently beats the sick person, particularly on the ailing part, with the bunch of herbs, which are dipped for a little while in the water of the pitcher, which has then become a little warm. The sick person falls immediately into a soft and copious sweat, which is increased or diminished at pleasure, according as the case requires. When the evacuation desired is obtained, the vapour is let off, the entrance is cleared, and the sick person clothes himself, or is transported on the mat to his chamber; as the entrance to the bath is usually within some chamber of his habitation,

"The *Temazcalli* has been regularly used in several disorders, particularly in fevers occasioned by costiveness. The Indian women use it commonly after child-birth, and also those persons who have been stung or wounded by any poisonous animal. It is, undoubtedly, a powerful remedy for all those who have occasion to carry off gross humours, and certainly it would be most useful in Italy, where the rheumatism is so frequent and afflicting. When a very copious sweat is desired, the sick person is raised up and held in the vapour; as he sweats the more, the nearer he is to it. The *Temazcalli* is so common, that in every place inhabited by the Indians there are many of them.

"With respect to the surgery of the Mexicans, the Spanish conquerors attest their expedition and success in dressing and curing wounds.†

* "The Spaniards, when they bathed, made use of a mattress for more convenience."

† "Cortes himself being in great danger of his life, from a wound he received on his head in the famous battle of Otompan, was greatly relieved, and, at last, perfectly cured by the Tlascalcan art of surgery."

" Besides the balsam and maripenda, they employed the milk of the *Itzontecpatli* (species of thistle), tobacco, and other herbs. For ulcers they used the *Nonahuapatli*, the *Zacatlipatli*, and the *Itzcuinpatli*; for abscesses and several swellings, the *Tlalamatl*, and the milk of the *Chilpatli*; and for fractures the *Nacazol*, or *Toloutzin*. After drying and reducing the seed of this plant to powder, they mixed it with a certain gum, and applied it to the affected part, covered the part with feathers, and over it laid little boards to set the bones.

" The physicians were, in general, the persons who prepared and applied medicines; but they accompanied their cures with several superstitious ceremonies, with invocations to their gods, and imprecations against distempers, in order to render their art more mysterious and estimable. The physicians held the goddess *Tzapopotlatenan* in veneration, as the protectress of their art, and believed her to have been the discoverer of many medicinal secrets, and amongst others of the oil which they extracted by distillation from the *Ocotl*."

(To be continued.)

ART. III. *Voyage a l'Ouest des Monts Alleghamys, dans les Etats de l'Ohio, du Kentucky, et du Tennessee, et retour a Charleston par les hautes Carolines; contenant des details sur l'Etat actuel de l'Agriculture et les Productions Naturelles des ces Contrées, ainsi que des Renseignemens sur les Rapports Commerciaux qui existent entre ces Etats, et ceux situés a l'Est des Montagnes et de la basse Louisiane; entrepris pendant l'an 1802, sous les auspices de son Excellence M. Chaptal, Ministre de l'Interieur. Avec une Carte tres soignée des Etats du Centre, de l'Ouest, et du Sud des Etats Unis. Par F. A. Michaux, M. D. &c. i. e. A Journey to the West of the Alleghany Mountains, in the States of Ohio, Kentucky, and Tennessee, and return to Charleston by the upper Carolinas; containing details on the actual State of the Agriculture and Natural Productions of those Countries, as well as Information on the Commercial Relations existing between these States, those situated on the East-side of the Mountains, and lower Louisiana; undertaken in 1802, under the patronage of his Excellency M. Chaptal, Minister of the Interior. With a very correct Map of the Middle, Western, and Southern States. By F. A. Michaux, M. D. Mem-*

ber of the Society of Natural History at Paris, and Correspondent of the Agricultural Society in the Department of Seine and Oise. 8vo. pp. 321. Paris. Levrault, Schaell, & Co. 1804.

SEVERAL times since the commencement of our reviewing labours, we have had occasion to notice the publications of the French concerning our country and its productions. An excellent work on the natural and botanical history of its numerous oaks, was noticed very particularly in the last volume of our first Hexade, p. 64. We presented to our readers an account in part of another work on the qualities of our soil and atmosphere, by another citizen of the same nation, in p. 172 of our present volume. In our present number, p. 394, we have given such notices as we judged requisite, concerning another performance from the same quarter, embracing a wide field of observation and research, no less than an entire flora or descriptive catalogue of all the plants growing in North-America; And now we lay before the citizens of these commonwealths, another French publication on the agriculture, produce, and commercial relations of the three western states. From a Parisian press we learn what connections Ohio, Kentucky, and Tennessee, have with the eastern or atlantic members of the union on the one part, and with the territory of Orleans and lower Louisiana on the other.

This book is another instance of the curiosity and interest with which Fredon and her associations are regarded by France. As far as we can comprehend the motive of the enterprise which gave rise to the journey of Mr. Michaux, it is this: By the treaty of St. Ildefonso Louisiana had been ceded to France; arrangements were making on the part of Spain to surrender the province to its new masters; troops and ships had been long in readiness to sail from the United Netherlands, to take possession in behalf of the French Republic; but the superior force of the British fleet rendered it unsafe for them to proceed on their voyage; for a long time they continued to be blockaded in port; the time of transporting this body of men was procrastinated; and the project was eventually abandoned.

The cession of this important province, so great in its extent, and situated so near the Fredish territories, to France was a theme of speculation, and inquietude to our government, and indeed to those of the greater part of Europe. The grantees seem to have viewed their newly acquired region with the

fondest expectations. The Republics which had been recently founded on the Ohio, the Kentucky, the Cumberland, the Tennessee, and other rivers running into the Mississippi, appeared to have a more natural affinity with Orleans and the country lying below toward the gulf of Mexico, than with their sister States, situated to the eastward of the great chains of mountains. It appeared to be an object worthy the attention of the government, to survey these growing and fertile settlements with an inquisitive eye. That their aspect in regard to Louisiana might be better comprehended, Mr. M. was dispatched by the minister of the home department, to visit them in person, and make a report to the government. And he appears to have had it in charge, to pay very little attention to the old settled States which occupy the spaces between the ocean and the mountains, but to proceed to the new establishments founded between the mountains and the Mississippi, and to make a return of his observations with all possible promptness and detail. This was actually done in the course of 1802.

Although afterwards Louisiana was ceded to the French, and the claims and pretensions of the French transferred to our nation, yet this political traveller has not been withheld from the publication of his remarks. By these we learn that he landed in Charleston (S. C.) proceeded coastwise to New-York, travelled by the ordinary route to Pittsburgh, proceeded down the Ohio by Wheeling to Limestone, and went thence to Lexington, Nashville, Knoxville, and through the western parts of North and South-Carolina to Charleston again. His book is a diary or journal of his progress and observations in the course of this tour.

His survey has the appearance of haste, and he seems to have proceeded from stage to stage with great rapidity, for we find him setting out from Philadelphia near the beginning of July, and arriving at Charleston a little after the middle of October; so that his whole peregrination to the western States, through them, and back again, must have been completed, and the principal parts of his information collected, in a little more than three months. And this is a small portion of time for a naturalist and public missionary to spend on a tour of eighteen hundred miles through such a country.

We find, on a perusal of this work, that the greater part of the observations are general, and we think mostly superficial. On the *commercial* part of his subject, we think he might have obtained much more correct views and ample estimates from the publication reviewed in our *Hexade* ii. vol. i. p. 172.

The *geographical* and *geological* facts concerning the western country have been much better stated by the careful observers whose works we mentioned in the same volume, p. 262, and in our present volume, p. 292. And the *botanical* researches of the writer's father, in the same places which the son visited, had precluded the probability of his doing much in that department. To all these may be added, the instructive *statistical* document concerning Louisiana, of which an ample review was given in our *Hexade* ii. vol. i. p. 390, and the remarks on the Mississippi and its muddy deposit made in our present volume, p. 194.

Being already in possession of all these, and other collections of facts and intelligence concerning the western states, their relations and connections, their wants and their supplies, their productions and their markets, which seem to have been more deliberately and carefully done than Mr. M. has found it possible to execute under the circumstances in which he was placed, we do not think it necessary to extract or translate any considerable part of his book. On the other hand, we pass it over without any particular exhibition, under a belief, that however novel the contents may be in France, recitals of clearing new lands, living in log-houses, voyages down the rivers to Orleans, rambling to distant places for a settlement, transportation of goods from the atlantic ports to the western states, using *homine* and bacon for food, and even getting drunk with rum, peach-brandy, and whiskey, are things which are very familiar to our ears in this country.

Although Mr. M. expresses on his title-page, that he travelled in the State of Ohio, yet it does not appear that he did any thing more than land at Wheeling, Marietta, Gallipolis, and a few other places, as he and his fellow traveller paddled down the river in a canoe to Limestone, in Kentucky. But there are a few things which we particularly cite. The prevailing opinion at Charleston and Savannah is, that the yellow fever is not contagious (p. 6.)—Of all the places that he visited he gives a preference, for healthiness of climate, beauty of situation, and convenience of business, to the banks of the Ohio, between Pittsburgh and Louisville (p. 123.)—The trade in ginseng failed because of the badness of its preparation, but has revived since a method has been discovered of rendering the root transparent (p. 185.)—The highest land in the Fredish dominions, is near the limits of North-Carolina and Tennessee, in the ridges called the *Grandfather Mountain*, the *Yellow Mountain*, the *Iron Mountain*, the *Black Moun-*

tain, and the *Table Mountain*; on several of the most elevated of which are found growing the trees and shrubs that are seen no where else south of Lower Canada (p. 277.)—He thinks the presence of animal matter is not essential towards the formation of salt-petre, in the vast calcareous caverns of Kentucky (p. 135.)—The attempt made to establish and propagate the vine in that commonwealth appeared to promise but little, and to be in a declining condition (p. 146.)—The frequency of taverns, and the abuse of spirituous liquors by the people, often surprised and shocked him, (p. 29, 34, 42, 56, 59, 118, 201, &c. &c.) as he seems not to have reflected, that among the enjoyments of liberty among a free people is reckoned the privilege of choosing the quantity and quality of their drinks, as explained in our present volume, p. 149, 150.

We find little else to notice or to quote in the thirty-two chapters into which this tourist has distributed his materials.

ART. IV. *Tableau du Climat et du Sol des Etats Unis d'Amerique, &c. i. e. Picture of the Climate and Soil of the United States of America, &c. By C. F. Volney. In two vols. 8vo. Paris. 1803.*

ART. V. *A View of the Soil and Climate of the United States of America, &c. London. Johnson. 1804.*

ART. VI. *A View of the Soil and Climate of the United States of America; with Supplementary Remarks upon Florida; on the French Colonies on the Mississippi and Ohio, and in Canada, and on the Aboriginal Tribes of America, &c. &c. Translated, with occasional Remarks, by C. B. Brown. With Maps and Plates. 8vo. pp. 446. Philadelphia. Conrad & Co. 1804.*

[Continued from p. 196.]

HAVING, on a former occasion, given an account of that part of this work which treats of the Geology and Mineralogy of the United States, we cannot proceed to the remainder of the performance until we offer a few further remarks on that part of the subject. Accordingly we notice, in terms of approbation, the elegant map with which Mr. Volney has illustrated his physical geography. In this, the granite country, extending east of the Hudson, through Connecticut, Rhode-Island, Massachusetts, Vermont, New-Hampshire, Maine, New-York, and Canada, from Quebec to the Lake of

the Woods, is distinguished by a *reddish* or *pink* colour. The granitical ridge, lying between the Hudson and the Roanoke, is painted in the same manner.

But it seems that Mr. V. sometimes writes by guess, and tells what he has never seen. He has marked in his map, and noticed in his text, the granitical rocks of Cape-Hatteras, and thence northward along the coast to Long-Island. Persons who have visited the beaches which lie between Albemarle and Pamlico Sound and the ocean, and have been at Currituck, Ocracock, Hatteras, and the neighbouring places, report that they know of no such masses of granite, or rock of any kind. The very stones of which the Light-house was built were brought from Rhode-Island. Fine sea-sand, small pebbles, and shells, form here, as in other similar situations, the ingredients of the shore. There is *very hard sand* in many places hereabout; and Shellcastle-Island is so called from the indurated marine shells compacted there. But the granitical rocks at Cape-Hatteras seem to have no more existence in nature than the granitical nucleus of Long-Island; nor are there good reasons to believe it the universal substratum of the sandy tracts, as he supposes. And it may be further observed, that Captain N. Holland, who published at London, in 1794, a chart of the coast, from Currituck Inlet to Savannah River, makes mention of sand, ouze, and shells at and off Cape-Hatteras, but has not a mark or notice of a rock.

A *green* paint immediately brings to the eye the lime-stone country, from its commencement, near the village of Esopus, in New-York, and its continuation through New-Jersey, Pennsylvania, Maryland, Virginia, and North-Carolina, on the one side of the Alleghany Mountain, and over the western counties of New-York and Pennsylvania, a great part of Indiana, Ohio, Kentucky, and Tennessee on the other. The sand-stone region is represented by a *brown* pigment; and its predominance is instantly recognized from the south side of the Mohawk, and among the sources of the Delaware and Susquehanna, as the great constituent material of the Fredish mountains, from their north-eastern extremity in New-York and Pennsylvania, to their disappearance in Georgia, and the extensive region lying to the westward of it. This is a beautiful and obvious manner of expressing the prevalence of any of the great strata of the earth, as over-spreading or under-laying an extensive tract of country. It is a pity that map-makers have not more generally observed it. But, although these three sorts of earthy matter are so plainly expressed, we examine the map in vain

to find, by a *blue* mark, the extent which slate and the other forms of shistus occupy. Wide and deep as they spread through the states and territories, they have not the smallest trace or vestige in the chart; and a similar omission is manifest in leaving the alluvial regions and tracts, undistinguished by *yellow* or any other particular hue or complexion. The size of this map (four times as large as the contracted imitations of it given by the translators) enables the reader to see the great chains of mountains, and the large distinguishing strata, delineated with strong lines and bold colouring. The plate of Niagara too is much more highly coloured and finished. Yet, after the proper deductions are made for the strokes of the painter and engraver, Mr. V.'s map does not greatly exceed the value of Mr. Arrowsmith's. From this, and from Evans's, Hutchins's,* Pownal's, Howell's,† Mitchell's,‡ and Bradley's,§ it was easy to compile a map. But we proceed to an examination of that part, to wit, the eighth and succeeding

* Thomas Hutchins, a Captain of the 60th regiment of foot, published, in 1778, a Map of the western parts of New-York, Pennsylvania, Virginia, and North-Carolina. It comprehends most of the country bordering on the western lakes and rivers. The ranges of mountains are plainly delineated, as they extend from the western part of New-York to Tennessee and beyond. The South, North, Alleghany, Laurel, Chesnut, and other Ridges, are particularly laid down.

† In 1792 Reading Howell's large Map of Pennsylvania was published. In this the mountains within that commonwealth are shaded and noted to a considerable detail.

‡ It was on Mitchell's Map, (heretofore described, Hex. i. vol. vi. p. 431.) that the Count d'Aranda marked the boundary line which his Catholic Majesty wished to establish between Spain and the British Colonies, when emerging to the condition of these Fredish States. The copy was in the hands of Mr. Jay, and is now in the Capitel at Washington. The proposal was made by the Count to Mr. Jay, in 1782. The proposed line was marked with red ink, and extends from the head of the Oakmulgee, east of the Flint River, and along the Mountains, to the head of the Holston River, to the mouth of the Great Kanhawa, up the Ohio to the mouth of the Hockhocking, and so to its source, and thence to near the mouth of the Miamis, near the south-west end of Lake Erie; and thence along to the southward and westward of Lake Huron and Lake Superior to the Lake of the Woods, including Lake Michigan and the lands on both sides. In this very valuable Map we find nothing of the *Algonkin* chain of mountains.

§ The Map published by Abraham Bradley, jun. though particularly calculated to exhibit the post roads, and the situations, distances, and connections of the post-offices, together with the stage roads, counties, and principal rivers throughout the United States, contains also some good sketches of the mountains from the Shawangunk chain in New-York, to the Apalachian heights in Georgia. The first edition of this large and instructive Map was published several years ago, and a new and improved edition came out in 1804.

chapters, wherein Mr. V. treats of the atmosphere and climate of our country.

And here, the information which he gives to his readers, though considerably detailed, is less satisfactory than might have been expected from a person who undertook to give a theory of the North-American winds. He opens this subject in his eighth chapter, in which he lays down the following positions: 1. *That the climate of the Atlantic coast is colder in winter, and hotter in summer, than their corresponding latitudes in Europe.* 2. *The daily variations are greater and more sudden than they are in Europe.* 3. *The climate of the bason of the Ohio and Mississippi is less cold by three degrees of latitude than that of the Atlantic coast.*

On these several points he has collected facts from various quarters. We have not had opportunity to examine all these sources of intelligence, but we will remark, that he quotes Major Williams' experiments on the freezing of water at Quebec in 1784 and 1785, as if he had never read the original. He writes of the fuze-holes of the iron bombs as having been plugged up with *wood*, while the relator of the experiments is careful to tell that the plug was *of iron, driven in with a sledge hammer, and, in some of his trials, secured by springs from being forced back by the expansion of the congealing water within.* Mr. V. may turn to the paper containing the recital of these instructive experiments, in the second volume of the Transactions of the Royal Society of Edinburgh, and in Dodsley's Annual Register for 1790.

He quotes, as a remarkable event, the rising of watery vapour from the River Delaware (tom. i. p. 140.), after a sudden change of the water from warm to cold. This emission of visible exhalation is not owing to the abstraction of heat to any ascertained degree, but proceeds from the difference between the relative temperatures of the water and the incumbent atmosphere. Thus, when the air is much more refrigerated than the water, the latter may afford watery visible vapour: and so, when a kettle of water is heated to a much greater degree than the surrounding air, the eye can discover aqueous steams rising from it. But for a set of original experiments on this curious subject, we refer Mr. V. to our Hexade i. vol. iv. p. 309—312, where he will find the relative heats of salt or ocean water, as well as of fresh cistern or rain water, and that of the neighbouring atmosphere, correctly investigated, and reduced to a rule or principle in nature.

Mentioning the methods of finding the mean annual temperatures of the climates and regions of the earth, our author seems to ascribe the idea of solving this problem by the heat of deep wells, or of running spring water, to the respectable historian of Vermont, (tom. i. p. 146.) He might have discovered references to much older authorities in *Kirwan's Estimate*. In addition to the excellent facts already extant, and quoted by these writers, Mr. V. will find some instructive experiments on the temperature of water, both as it rests stagnant in profound fountains, and gushes out in copious streams in the vicinity of New-York, related at large in our *Hexade* ii. vol. i. p. 414—416. These corroborate his general doctrine of the earth's steady and internal heat corresponding *cæteris paribus* to the solar influence.

In the northern parts of America the author makes the extremes of annual variation from 130 to 135 degrees of Fahrenheit's scale, between 40 degrees below 0 at Hudson's Bay, and 90 and upwards at Salem, (Massachusetts). In the middle States of Fredon, the extremes between which the quicksilver fluctuates are nearly 95 to 105 degrees. The range in the southern States of the Union he states as being about 70 and 75 degrees only; and the range lessens as you approach the Equator.

We present our readers with a version of his account of the climate of the countries bordering on the Ohio and the Mississippi (p. 160—172.)—"Throughout my route on the Ohio, and at my different stations in Kentucky, at Galliopolis, at Limestone, at Washington (Kentucky), Lexington, Louisville, Cincinnati, and Post Vincennes, the communications which I received went unanimously to the establishment of the following facts.

"Winter does not commence until near its solstice, and the colds are manifest for only the forty or fifty succeeding days. They are not even then fixed and constant; but there are respites of temperate and warm days. The thermometer does not commonly fall lower than 18 or 20°. The frosts which first show themselves during some days in October merely to disappear again, to return towards the end of November and to cease once more; the frosts, I say, are not confirmed until toward January. Brooks, small rivers, and stagnant waters then freeze, but rarely remain frozen more than from three days to a fortnight.

"The winter of 1796-7 was considered as unexampled, when the mercury fell to 2° below zero, and the Alleghany, Monongahela, and Ohio rivers were closed with ice from the

28th of November to the 30th of January; that is to say, for sixty five days: the Wabash freezes almost every winter, but only for a duration of from three days to a fortnight. Through all Kentucky, and the basin of the Ohio, the snow usually continues not longer than from three to eight or ten days; and even in the course of January there are really days as warm as 66 to 72°, occasioned by winds from the south-west and south, and by a brilliant and pure sky. The spring brings rains and showers by winds from the north-east and north-west; but within forty days from the equinox the heats prevail in earnest. They are in full force during the sixty or seventy days succeeding the summer solstice. The thermometer then is about 90 or 95°. At Cincinnati and Lexington, in 1797, it was observed to be higher. During all this time storms occur almost every day on the Ohio; they there produce a heavy heat, which the rain does not abate. Sometimes they are attended by south and south-west winds, and then again they are the result of the evaporation from the river, and the vast forest which covers the country. The rain, which they pour in torrents, gives but a momentary refreshment to the parched soil, and the heat of the next day raising it in vapour, forms, during the morning, thick fogs, which finally turn to clouds, and recommence the electric exhibition of the evening. The river-water is at the temperature of 64 to 66° above 0. The nights are calm, and it is only between eight and nine o'clock in the morning that there springs up a light breeze from the west or south-west, which ceases at about four in the afternoon.

"On the average of seasons, the prevailing wind is the south-west;* that is to say, the current of air which follows up the track of the river Ohio, and which comes by the Mississippi (where it runs south) from the gulf of Mexico. I found this wind warm and stormy on my entrance into the

* The prevalence of winds from the south-west is confirmed by the report of Mr. De Witt, the Surveyor-General of New-York, to the legislature of that State, on the establishment of a village near the head of Niagara river, in February, 1805.

"By reason of the velocity with which the waters issue out of lake Erie, and the bleak exposure of the coast, no very good harbour is to be found at the head of Niagara river. The best is immediately below *Bird Island*, and this has been mostly resorted to by vessels not necessarily doing their business on the British shore. The force of the current, and the effects of the south-westerly winds, which frequently blow here with great violence, are broke by the island. The bottom also affords better anchoring ground here than is elsewhere to be found about the outlet of the lake. From these considerations it will appear obvious that the best place for a town is such building ground as can be found nearest to this natural harbour." *Edit.*

valley of the Kanhawa, whose temperature is undoubtedly raised by it, as it is arrested at the foot of the mountains. It changes its course according to the bends of the Ohio, so that it might sometimes be supposed to come from the west or south. But always the same, it prevails ten parts in twelve of the time, and leaves but two to all the other winds together. It reigns equally throughout Kentucky, but it does not there produce the same effects; for while the valley of the Ohio, for a breadth of five or six leagues, experiences humidity and copious rains, the rest of the country is distressed with droughts, which are sometimes of three months continuance, and the planters have the mortification to see from their cottages an atmospheric river of fogs, rains, and showers, which follows the serpentine course of the terrestrial river, and does not depart from its bason.

“ At the autumnal equinox the rains are with winds from the north-east, south-east, and even from the *north-west*; the coolness they produce is the forerunner of frosts; the whole autumn is serene, temperate, and the finest of the three seasons of the year; for on all the continent of North-America there is no spring season.

“ Such is the climate of Kentucky, and of the whole bason of the Ohio. One must go pretty far to the north to find any remarkable alterations, and especially to discover it in harmony with its parallels on the coast of the Atlantic. As high as Niagara itself, it is so temperate, that the colds do not last more than two months with any severity; and this is, nevertheless, at the most elevated point of the platform, a circumstance which overturns entirely the rule of levels.

“ Through all Genesee the descriptions of winter that have been given me do not correspond with the colds of that season under the same parallels in Vermont and New-Hampshire, but rather with the climate of Philadelphia, three degrees further toward the south. In this latter city it has been observed as a singular thing, that it freezes every month of the year except July. And to find a similar occurrence, we must ascend quite to the Oneida village in Genesee, in lat. 43° ; while, on the east side of the mountains, at Albany, it freezes every month, and they cannot ripen either peaches or cherries.

“ Lastly, at Montreal, in lat. $45^{\circ} 20'$ the colds are neither so rigorous nor so long as in Maine and Nova-Scotia, to the eastward of the mountains; and the snows at this same Montreal do not continue so long by two months as they do at Quebec, although this latter town is situated lower down the

river, which contradicts again the law of levels; and points to another cause which remains to be investigated.

" Before proceeding to this, I shall add some further observations and facts which will be a good preparative to the disclosure.

" 1. It results from the comparisons which I have just offered, that to measure the different degrees of temperature in the United States; we must apply to the average of this country, two great thermometric scales crossing each other in opposite directions; the one placed in a natural course of latitudes, having then the *maximum* of cold toward the Pole, as the St. Lawrence for example; and the other its *maximum* of heat toward the tropic, as for instance, in Florida. Between these two points, the heat, under equal circumstances of level and exposure, decreases and increases regularly according to the latitudes. The other scale, placed transversely from east to west, in the lines of longitude, is a thermometer of two inverted branches, having a common bulb or maximum of cold, which is placed on the Alleghany, while the extremities of the two tubes, extending far to the east and west, determine the *maximum* of heat on the shores of the Atlantic and of the Mississippi, and the degrees of heat are measured upon each in a compound ratio of the levels and of the exposures.

" It is only by paying attention to these complicated rules that a good general picture can be given of the temperature and vegetation of the United States. The idea which has been thrown out in the memoirs of the New-York Society is ingenious and may be useful; but to accomplish the object with exactness, it stands in need of the application and aid of the principles now explained.

" 2. The difference of climate between the east and west sides of the Alleghanies, is besides attended with two important circumstances, that I believe have never been remarked. The first is, that beyond the 35th and 36th degrees of latitude travelling to the south, this difference ceases, and the temperature of the Floridas and of Western Georgia, from the Mississippi to the river Savannah and the ocean, is governed by identical and common rules; so that the chain of the Alleghanies and the turn of the Apalachies really constitute on this side the boundary of this difference, and by that matter itself, they are ascertained to furnish one of the operative causes.

" The second circumstance is, that this relative excess of temperature ceases again almost suddenly between the lati-

tudes of 43 and 45 degrees north, towards the great lakes of the St. Lawrence. You scarcely pass the south shore of Lake Erie before the climate grows cold from minute to minute to an astonishing degree. At Fort Detroit, it, indeed, corresponds to its parallel of Niagara. But beyond Lake St. Clair the settlers find the colds much more long and rigorous than at Detroit. This small lake continues frozen every year from November to February. The winds from the south and south-west, which temper Lake Erie, are more rare here, and no other fruits ripen than winter apples and pears.

"At Fort Michillimackinack, two degrees and an half further north, observations made under the direction of the American General Wilkinson, state, that from August 4th to September 4th, the thermometer in different situations from Lake St. Clair never indicated more than 70 degrees, and that in the evening and morning it often sunk to 46 degrees; and this is colder than at Montreal on the same parallel.

"These facts agree perfectly with the general results recently published by Mr. Alexander Mackenzie, in the account of his interesting Travels to the west and north-west of America. I had already, during my residence in Philadelphia, had an opportunity of knowing this estimable traveller, and of obtaining from him various information upon these subjects. One of his associates too, Mr. Shaw, whom I had the good fortune to meet in 1797, and who returned after a residence of thirteen years, at the most distant establishments of the fur-trade, was, in like manner, polite enough to answer my inquiries, and the result of their joint information is as follows:

"That leaving Lake Superior, and going to the west, as far as the *Stony* or *Chipewyan* Mountains, and proceeding north, as far as the 72d deg. of latitude, the country now well known to the Canadian traders, presents a severity and intensity of cold which can only be compared to Siberia: that the soil is generally flat, bare of trees, or these few and stunted, interspersed with lakes, swamps, and a prodigious number of water courses, is incessantly assailed by furious and frosty winds, blowing from the regions of the north, or north-west: that from the 46th deg. *the earth is frozen all the year round*: that at several stations for holding of treaties, they have not been able on this account to make wells, necessary as they are: that Mr. Shaw himself had dug one at Post St. Augustine, at about sixteen leagues from the mountains, and although he began it in July, he had found the ground frozen at the depth of three feet; and finding it harder and harder as

he proceeded, he was forced to abandon the undertaking, after he had penetrated to the depth of twenty feet.

“ These facts are placed beyond the reach of doubt, not merely by the character of the witnesses, but by the support they derive from others which resemble them. Robson, the English engineer, who, in 1745, constructed Prince of Wales's Fort in Hudson's-Bay, in about 59° relates, with surprise and candour, that having a mind to dig a well in the month of September, he first found thirty English inches of earth thawed by the preceding heats, then a layer of eight inches frozen as hard as a rock; beneath this stratum, a soil sandy and loose, icy and very dry, in which his borers could find no water, because, says he, the incessant cold freezing the waters on the surface, prevents their penetrating below the point at which the summer heats come to melt them.

“ Edward Umfreville, factor of the Hudson-Bay Company, from 1771 to 1782, a sensible and correct observer, in like manner testifies, that the earth, in those countries, even at midsummer, where the heats are lively for four or five weeks, never thaws more than four English feet, in places cleared of trees, and exposed to the action of the sun; and only two feet where they are shaded by the dwarfish junipers and firs, which make the whole vegetation of the country.

“ It is therefore evident, that beyond a certain latitude, the climate, west of the Alleghanies, is no less cold than its parallels on the east. And this latitude, whose mean term seems to be towards the 44th or 45th deg. by taking for its boundary the great lakes, and more particularly the chain of *Canadian** or *Algonquin* Mountains, circumscribes thereby the warm climate of the western country, to a space of about nine or ten degrees, three sides of which are surrounded by mountains. Undoubtedly, the presence of these mountains contributes, in some measure, to this difference; but what is the greater and fundamental cause of it? Whence proceeds this truly singular geographical phenomenon? This is the problem to be solved; and as a comparison of a great many facts and circumstances have led me to consider, as the chief agent, a current of air, ha-

* Here Mr. Volney seems again boldly to have ventured in constructing and colouring a vast chain of mountains between Canada and Hudson's-Bay, which is almost as long as the great Chinese wall on the confines of Tartary, and by their appearance and description on paper, incomparably higher. There are no doubt some elevated grounds which divide the waters and mountains too in some places; but we have no correct account or geological description of such a chain of Algonquin Mountains as is delineated on the chart, and alluded to in the work.

bitually prevailing in the bason of the Mississippi, whose winds differ from those on the Atlantic coast, I believe I can furnish the reader with the means of settling his opinion, by developing to him the whole system of atmospheric currents which prevail during the year in the United States."

The author, in his ninth chapter, proceeds to unfold his system of the winds which prevail in the fluctuating and variable atmosphere of Fredon. The great moving power which actuates this widely-extended body of ærial fluids, he traces to the gulf of Mexico. He endeavours to show, how a hot and moist air is wafted thence to the northward, warming and watering the regions over which it blows. He presumes he has demonstrated, that the south-west wind predominates along the Mississippi, the Ohio, and the adjacent regions; that this south-west wind in Fredon is nothing more than the trade wind of the tropics, under a new direction and modification; and that, consequently, the atmosphere of the western country is merely the atmosphere of the Mexican gulf, and anteriorly of the Caribbean Sea, transported to Kentucky. From this position is deduced a simple and natural solution of the problem, which, at first glance, appears embarrassing, to wit, wherefore the temperature of the western country is warmer by three degrees of latitude, than that of the Atlantic coast, while the only barrier is the Alleghany chain. Another consequence of this position is, that the south-west wind being the cause of an higher temperature, it will so much the more enlarge the sphere which it will more safely penetrate in the country; whence may be derived a favourable presage respecting countries situated where it passes, and under its influence, that is, the tracts bordering on Lakes Erie and Ontario, and indeed the whole bason of the St. Lawrence, to which the south-west wind reaches. From this quarter, a more speedy improvement of the climate may be expected, and a more perceptible one than in the regions situated considerably further south on the other side of the mountains. And this amelioration will happen in proportion to the clearing of the forests which impede the passage of this atmospheric stream. He thinks this cause has already begun to work its effects, because since the æra when Canada was first colonized, the times of the closing of the river by ice have become almost a month later, so that instead of insuring vessels on condition of their getting out by the end of November, as used to be specified at the beginning of the last century, the actual stipulation in the policies now has reference only to the 25th of December, or Christmas-day.

(To be continued.)

ART. VII. *Cautions to young Persons concerning Health; in a public Lecture, delivered at the Close of the Medical Course in the Chapel at Cambridge, November 20, 1804; containing the general Doctrine of Chronic Diseases, showing the evil Tendency of the Use of Tobacco upon young Persons; more especially the pernicious Effects of smoking Cigarrs; with Observations on the Use of ardent and vinous Spirits in general. By Benjamin Waterhouse, M.D. Professor of the Theory and Practice of Physic, and Teacher of Natural History in the University of Cambridge. 8vo. pp. 32. Cambridge. Hilliard. 1805.*

OBSERVING the frequent and intemperate use of tobacco and strong liquors among the youth educated at this long-established and much-frequented institution in Massachusetts, Professor Waterhouse has stepped forth to warn them of the pernicious consequences of making free with that narcotic plant, and these inebriating products of the vat and the still. To make his precepts and doctrines the more impressive, he has committed the Lecture to the press, and inscribed it to the medical students, resident graduates, and scholars of every class.

Professor W. has given an interesting view of the consequences of chewing, snuffing, and smoking tobacco, and of drinking wine, brandy, and other intoxicating liquids. The parents and guardians of young men ought to be much obliged to him for having interposed so seasonably to check the progress of those vices, and to save the health, lives, and morals of the rising generation. And it seems to us that the trustees of the university owe him the acknowledgment of having zealously laboured to discourage the use of two very powerful stimulant substances, tobacco and alcohol; which, though neither of them is necessary to life, but the relish for both is wholly artificial and acquired, do, nevertheless, govern their votaries with almost absolute sway, and frequently by establishing in them inveterate habits of subjection, entail upon them eventually wretchedness and ruin.

It would please us to hear that this lecture was read in every college in the nation, and that each student at every one of them had a copy in his pocket. Though the objects of it are so amply expressed in the title, that we think it not necessary to go further into particulars, nor to make extracts. For, in opposition to all that the academic disciples of BACCHUS and

NICOTUS (the God of Tobacco, not known to the Romans) have urged, we are entirely of opinion, that they ought not to puff the philosophic pipe, nor circulate the exhilarating glass, until they shall have taken their Doctor's, or at least their Master's degree.

ART. VIII. *Nature Displayed, in her Mode of teaching Language to Man; or a new and infallible Method of acquiring a Language in the shortest Time possible, deduced from the Analysis of the Human Mind, and consequently suited to every Capacity. Adapted to the French. By N. G. Dufief, of Philadelphia. Vol. i. pp. 469. Vol. ii. pp. 434. 8vo. Philadelphia. Manning. 1804.*

THE efforts which have been made in modern times to ascertain the fundamental principles of elocution, to investigate the philosophy of language, and to improve the means of acquiring it with facility, deserve to hold a distinguished place in the history of the progress of the human mind. The dignity of this subject will be felt by all who consider that articulate speech is one of those prerogatives which elevate man so far above the rest of the animal creation. Nor will the importance of these inquiries sink in our estimation when we reflect on the power of language as an instrument for the acquisition of knowledge, for the communication of it to others, and for the progressive extension of its limits.

The physiology of elocution is a fruitful subject of research, and has gained, accordingly, a large share of attention. The structure and functions of the vocal organs, and the theory of articulate sounds, have been investigated by very able men with great diligence and success. An examination of the structure and offices of all the various organs employed in the complicated process of enunciation, and the analysis of the sounds of speech into their elementary principles, are calculated to shed much new light on this subject, and have actually effected much towards the accomplishment of this desirable purpose. Physiological principles, and the laws of musical proportion are considered by many, and apparently with much reason, as the bases of the science of elocution. It is easy to perceive the importance of such inquiries into the fundamental doctrines of elocution, in a practical point of view. They possess an evident application to the natural defects and habitual impediments of speech, which constitute very serious

diseases, and demand every remedy that art can supply. They greatly conduce to an understanding of the causes, phenomena and treatment of such defects and impediments. They are adapted to point out the means of correcting all improper tones and inflections of voice, as well as all other ungraceful habits of speech, and thereby to improve the different branches of elocution, such as reading, recitation, oratory, &c. And, finally, they may be useful in teaching the construction and application of many artificial means of aiding the exertion, and supplying the defects of natural organs.

Our acquaintance with the principles of elocution has been greatly advanced, by the exertions of many ingenious men, who have employed themselves in teaching the deaf and dumb the use of language. *Mr. Braidwood** was greatly distinguished for his diligence and success in this employment. His method of instruction was primarily and chiefly directed to the bringing into action the organs of speech, and to the proper forming and regulating of that action. The wonderful success of his labours is well known. A different method, though equally laborious and successful, was practised by the *Abbè de l'Epeè*. He began his instructions, not by endeavouring, like *Mr. Braidwood*, to form the organs of speech to articulate sounds, but by communicating ideas to the mind by means of signs and characters. The celebrated *Sicard* devoted himself to the same object. By means of physical processes, most ingeniously devised, he was enabled to render the most metaphysical abstractions visible and intelligible to his pupils.

The estimable author of the work before us seems to have had every improvement on this subject in full view when he undertook his labours. To the aid he derives from a knowledge of what had been done by others, he adds whatever his own experience and reflections could supply. The great object of the work is to prove that the speediest and easiest method of acquiring languages, is by use, practice, and the habit of speaking, without the intervention of grammar. The principal improvement which he claims for himself is that of teaching languages through the medium of phrases; as in this plan the signification of words is learned by forming an acquaintance with them as they stand connected in phrases and sentences. By this means, the vocabulary and the idiom of a language are acquired at the same time, and become inseparably

* See our present volume, p. 73.

united. The chief merit of this method consists in its being a close imitation of the process of nature, in conveying the knowledge of language to children. A higher encomium on it need not, in our opinion, be sought by the ambition of the author. We hope this performance will be in the hands of all who wish to spare themselves the drudgery, the circuitousness, and the waste of time which attend the acquisition of languages in the modes commonly practised.

ART. IX. *Friendly Cautions to the Heads of Families and others, very necessary to be observed in order to preserve Health and long Life: With ample Directions to Nurses who attend the Sick, Women in Child-Bed, &c. Third Edition with Additions. By Robert Wallace Johnson, M. D. The first American Edition, with Notes and Additions. 12mo. pp. 163. Philadelphia. Humphreys. 1804.*

THIS manual contains directions for the management of the sick, and the preparation of their diet, &c. which nurses are apt to neglect, and physicians too frequently disdain to superintend. It has been long before the public in Great-Britain, and has been generally esteemed as very useful in families. To this American edition some notes are subjoined, and some additions made, which will be found considerably to enhance its value. And we cannot omit to observe, that we think the American reader is much indebted to Mr. Humphreys, the publisher, for the zeal he exhibits in the re-publication of practical and well-selected books.

MEDICAL & PHILOSOPHICAL NEWS.

DOMESTIC.

LOCALLY ENGENDERED YELLOW FEVER AT LEGHORN, IN ITALY, 1804.

IN the southern parts of Europe we observe the ravages of the yellow fever year after year. In the year 1800 Cadiz, and the adjoining country in Spain, were sorely afflicted by that distemper. Our readers will find the first notice of this calamity in our *Hexade* i. vol. iv. p. 320. This was followed by a more particular account, translated from the official statement in the *Madrid Gazette*, which may be seen by turning to our *Hexade* i. vol. v. p. 103—112. Afterwards, in vol. vi. p. 63, of the same *Hexade*, we gave a review of a Spanish publication at Cadiz, on the yellow fever of that year.

It now appears that Italy is also visited by the yellow fever. During the summer and autumn of 1804, the city of Leghorn, in the kingdom of Etruria, has suffered a severe visitation from it. It began to be serious about the 20th of August, and continued until the end of November. In a little more than three months, Leghorn, which has a population of 60,000 inhabitants, lost upwards of 700 by this distemper.

We have in our hands a publication on this yellow fever, as it appeared at Leghorn, by Dr. GAETANO PALLONI. His work is entitled, *Osservazioni Mediche sulla malattia febrile Dominante in Livorno, per servire d'Istruzioni ai Signori Medici destinati al servizio del nuovo Spedale provvisorio di S. Jacopo*: that is, *Medical Observations upon the febrile Disease prevailing in Leghorn, intended as Instructions to the Medical Gentlemen appointed to serve in the new provisional Hospital of St. James*. It was published in December, 1804. The author stiles himself an honorary Professor of the University of Pisa, and a Medical Commissioner on the part of the government to co-operate with the Health-establishment of the city.

PALLONI treats of the distemper under three titles: 1. A description of the symptoms; 2. An account of the appearances on dissection; and, 3. Remarks on the clinical treat-

ment of the diseased. To these are added three tables, exhibiting the state of the weather, number of deaths, occupations in life, &c.

This disease is described as being one, which, however it might vary in its origin and progress, was always characterized by the following symptoms, (p. 8.) *In the beginning a propensity to vomit; pains in the limbs; a most intense head-ach, more especially in the forehead and temples; a sensation more or less troublesome in the pit of the stomach and the region of the liver; a colour like that of jaundice; and toward the end, puking of a matter resembling the grounds of coffee; bleedings from the throat and nostrils; hiccuping and convulsions.** In page 9, he writes, that the disease, in some cases, manifested unusual symptoms, such as dread of water, seeing objects double, seeing them larger than they usually appear, bleedings from the ears, pimples, and swellings of the parotid glands. In some the yellowness was entirely wanting; and in others there was the icteritious hue, without any sensible fever. The disorder appeared under the three following forms in its first stages, (page 13) to wit, 1. With symptoms of vascular irritation, pyrexia after a cold fit, most acute pain in the head, fiery and sparkling eyes, tense pulse, and a burning skin. 2. With gastric symptoms, bitterness in the mouth, foul tongue, with dark-red edges, and a yellowish-black centre, nausea, vomiting, and load at the stomach. 3. With nervous symptoms, such as stupidity, low and slow pulse, depression of strength, and an appearance, from the commencement, of a malignant or nervous fever. The author indeed owns, that the distemper had the nearest resemblance to the *typhus icteroides* of nosologists, and, consequently, to the epidemic fevers in the West-Indies, (p. 27) except that it was infinitely more mild and circumscribed. There is not the smallest hint of its having been imported; so far from it, the writer thinks it not contagious.

On the freedom of this disease from contagion, we translate PALLONI's own words for the information of our readers (p. 29.) "The infection of this fever is of such a constitution, that pure and renewed air decomposes its fomes at a small distance from the sick; on the other hand, an air that stagnates, and is

* "Incitamento al vomito in principio; dolori alle membra; dolor di testa intensissimo alla fronte, e alle tempia; senso più, o meno molesto alla regione epigastrica, ed al fegato; colore itterico; vomito in fine di materia simile ai fondi del caffè; emorragie dalle fauci, e dalle narici; singhiozzo, e convulsioni."

replete with animal exhalations, easily becomes a vehicle for it. Hence it happens, that as soon as the disorder broke out, we saw it rage most fiercely in the most filthy and least ventilated parts of the city, and more especially in the houses of the poor, in which, besides the individual indisposition necessary to the action of every contagion, the narrowness and nastiness of the chambers, and the multitude of inhabitants multiply the points of contact, and render the infection more easy of communication. On the contrary, in spacious and clean streets, in comfortable, genteel, and airy houses, the disease scarcely appeared, or was easily stopped. So, in like manner, in such hospitals as were well situated and clean, the infectious fomes was confined to the individual sick, without invading the assistants, or spreading to those who laboured under other diseases, which does not happen in other epidemic and contagious distempers. For the same reason it is, that the fever we are speaking of is disposed, for the most part, to take up its quarters in sea-ports, without spreading far inland. And in those who have removed from the country where it prevails, if they were not sick at the time of their departure, the seeds of infection are not generally unfolded, as they seem in such cases to be corrected or destroyed by the change of air and situation. In short, with the exception of two or three streets in Leghorn, where the disease seemed to have fixed its seat, few other parts of the city were attacked by it for a moment, and not even then if they were more than the smallest distance removed, although a great number of persons, and vast quantities of merchandize were moved from the points where the disease raged, and daily transported and dispersed into the neighbouring country. To this there were few exceptions, and in those cases the disease ended in the very houses where it broke out.

“An healthy man, although exposed in the vicinity of the diseased, has never communicated the infection to another, if he himself has not fallen into the disease. And, in truth, by means of greater precautions and measures specially taken in the cases of those who were really seized with illness, and of the clothes that immediately belonged to them, there has been no example of other healthy individuals of the same family, or other goods of the same house, having ever been vehicles of infection abroad. Papers, money, and wares of all sorts have been in continual circulation and indiscriminate commerce within and without the city, and nevertheless the contagion was not spread by them. I have, besides, observed that a certain habit gradually acquired to receive the impression of this

miasma, has easily deprived it of the power to act; indeed, among so many Priests as daily attended the sick, there was but a single one attacked and destroyed by the disease; not one of the assistants in the hospital experienced its effects; and only two or three professors of the healing art, who were surrounded by the sick almost continually for a great length of time, imbibed the infection.

“ If then, to take it there is need (besides a natural disposition) of the approach or contact of a sick person, and the additional circumstance of a stagnant pent up air, loaded with animal exhalations; if a moderate seasoning is sufficient to elude its force; if well persons, although exposed in the neighbourhood of the diseased, and merchandize exposed to a free air have never carried the infection to any distance from the city; and, lastly, if a pure and ventilated air destroys this morbid fomes in the proximity of its centre, as of a sick man, who is there that does not see the difference between the miasmata of the Leghorn distemper, and of all other pestilential contagions? How much smaller is its strength and diffusibility? And how false are the opinions formed of it, and how ill-founded the fears entertained by the people of the adjoining country?

“ But there need be no stronger or more cogent argument in favour of the usefulness of pure, fresh, and renewed air in this disease, than the happy experience of its efficacy in the new hospital of St. James. Situated as it were on the margin of the sea, remote from the unwholesome vapours of the town, and exposed to free access of the purest air, which by reason of its construction and disposition can act upon it to the utmost advantage, it is well worthy of remark, that it was scarcely opened for the reception of the sick, than from that moment its violence and extent began to abate in the city, and a great proportion of the destined victims were snatched from death. It was wonderful to behold the wretched sufferers taken from their houses debilitated, oppressed, and, as it were overcome, with illness, who were no sooner lodged in this new asylum, than the vital principle appeared to be renewed in an instant; they revived; they declared that a sensation of well-being succeeded to anguish and oppression; and the distemper immediately assuming a milder form, yielded to art, and a suitable plan of treatment was at once adopted. In a short time the sick recovered from a short and easy convalescence.”

Thus we see the southern and western parts of Europe are subject to the same diseases which occasionally afflict the

southern and eastern parts of America. Let the writers of books, the readers of lectures, and framers of laws, henceforward remember that the like effects ensue all the world over from similar causes. While they discuss, therefore, the unhealthiness of maritime places on the continent and islands of America, it will be highly worth their while to watch narrowly the locally engendered and home-bred yellow fevers which desolate those boasted seats of health, the shores of the Mediterranean, within the limits of Christendom.

STATEMENT AND CONTRADICTION OF A REPORT OF THE
IMPORTATION OF CONTAGION AT LEGHORN.

*Extract of a Letter from a Gentleman in Leghorn, to his
Friend in Philadelphia, dated Dec. 22, 1804.*

"The late fever with which we have been visited, I am persuaded is the same as the American yellow fever. It has been proved beyond all shadow of doubt, that it was imported from South-America, in a ship laden with hides, which touched at Cadiz to recruit its hands, having lost several on the passage. The Captain died of the fever in a short time after he arrived. His men also fell victims in succession to the same fever; and even the men who went on board his vessel to repair some damages she had sustained on her voyage, shared the same fate. Few of the persons in the family in which the Captain died escaped the fever, and of all who had it, scarcely one survived. Unfortunately the spot where it broke out was the most filthy, unwholesome, and confined part of the town, and from it the fever was spread to all the streets in its neighbourhood. There was something mysterious in the nature of this fever—for though we have no doubt of its being imported, yet we observed in the hospitals, where the sick were conveyed, not a single person out of one hundred who attended them in different capacities, was infected—nor did any of the men, amounting to between three and four hundred, who carried the dead to their graves, take the disease. It raged from the 15th of August to the 20th of October, during which time there died about seven hundred persons."

*Extract of another Letter from the same Gentleman, dated
January 2, 1805.*

"Since writing my letter to you of Dec. 22d, I have seen the Spanish Consul, and requested from him a particular account of the vessel which brought the contagion of the yellow fever to Leghorn. He assured me the whole report of the

origin of the fever from the vessel was groundless and untrue; she had lost one of her sailors only since her arrival in the port, by a mortification in his leg; and that one man who was in a consumption, and who had gone on board of the vessel to paint her, had some time afterwards died of his disorder. That the Captain was so far from being dead, that he had dined with him every day since his arrival in the port, to the day of his departure. I asked him why he did not make the account he had given me public, and thereby refute an error of such great magnitude, and so interesting to the lives of seventy thousand people. He said, the report was gone forth, was generally believed, and that with avidity, and to oppose the torrent would be dangerous to any man."

YELLOW FEVER AT MALAGA AND OTHER CITIES IN THE
SOUTH OF EUROPE.

Besides the distemper we have described as having prevailed at Leghorn, there has been a more furious calamity, from a similar cause, at Malaga, of the same kind with that which scourged it in 1803. And Alicant, Carthage, Algiers, Gibraltar, Cadiz, and several other places, have also suffered severe visitations from the like sickness.

At Malaga the deaths had been as numerous as fifty a day, so early in the season of 1804 as the 11th of August. Before that time the disease had excited great alarm by the deaths it caused, but had subsided again; even after the 11th the deaths diminished considerably for a few days. On the 14th all the physicians of the place subscribed a written opinion in the following words, before the magistrates:

"We, the undersigned physicians certify, that no epidemical disease prevails at Malaga at present. It is a sort of *ague* or *malignant fever*, similar to that which rages in many other parts of Spain; and it has of late so much subsided, that out of twenty people taken ill, only five died, whilst, on its first appearance, fifteen died out of twenty. We hope, that by the use of gentle medicine, and by taking the necessary precautions of fumigating the houses where the disease has existed, it will soon disappear."

By the publications made at the time, we find that this *ague* or *malignant fever* was, on the 18th, called a *contagious fever*. As it increased in extent and violence, they, on the 22d, called it *the plague*; as on the preceding day, the number of deaths had increased to one hundred and forty-eight.

As soon as the disorder was pronounced *contagious*, and de-

clared to be "the plague," the customary methods of stopping intercourse were rigorously put in force. Vessels were quarantined, travelling by land was prohibited, and while the unhappy inhabitants of the town were restrained from seeking safety in the country, the inhabitants of the country were equally restricted in carrying supplies to market. Want, distress, famine, terror, dismay, desperation, and death, were, as usual, the shocking consequences of this absurd though common mode of proceeding. And the inhabitants of the town, cooped up, and compelled to stay in their venomous atmosphere, instead of moving a few miles into the country, have perished by thousands.

The following account of the situation of Malaga is extracted from a letter, dated Malaga, December 3, 1804:

"It is impossible to form a just idea of the aspect exhibited by our unfortunate city. It resembles a desert. The mortality here has in some measure ceased, it is true, for want of victims. Seven thousand persons only have escaped its attack: twenty-six thousand have fallen a sacrifice to it.

"The effects of this great disaster are remarked in every thing that surrounds us. The grapes have rotted on the vines for want of hands to gather them. On all sides we hear the cry of Bread! Bread! The plague is every where succeeded by famine.

"In most parts where the epidemic has prevailed, the following observations have been made:—It was less fatal to females than to males, and it appears that it had no influence on old women, for they continually assisted the sick without being attacked by it. Persons of a delicate constitution were also less subject to its fatal effects than those of a robust constitution. In regard to the negroes it scarcely produced any effect on them."

The opinion of the contagiousness of the disorder operated so powerfully, as to cause the horrid scenes exhibited in Messina (see our present volume, p. 227,) to be acted over again at Malaga. And a calm and candid observer, in beholding tragical representations like these, cannot but admire the two-fold delusion which misleads the christian nations, first to ascribe contagion to a disease which has no contagious quality, and, secondly, under that mistaken notion to adopt regulations which, instead of preventing the distemper, add infinitely to its malignity and mischief.

It is remarkable, that the Barbary coast has, during these visitations of Spain and Italy, been very healthy; and in nei-

ther of those parts of Europe do the people ascribe their disease to importation.

EXTENSION OF THE MEANS OF MEDICAL RELIEF TO FREDISH SEAMEN.

By the act of Congress for the government and regulation of Seamen in the merchant's service, passed July 20, 1790, there was a regulation made for supplying vessels with medicine chests. The eighth section of this law provides, "that every ship or vessel belonging to a citizen of the United States, of the burthen of *one hundred and fifty* tons or upwards, navigated by *ten* or more persons in the whole, and bound on a voyage without the limits of the United States, shall be provided with a chest of medicines, put up by some apothecary of known reputation, and accompanied by directions for using the same; and the said medicines shall be examined by the same, or some other apothecary, once at least in every year, and supplied with fresh medicines in the place of such as shall have been used or spoiled; and in default of having such medicine-chest, so provided and kept for use, the master or commander of such ship or vessel shall provide and pay for all such advice, medicine, and attendance of physicians, as any of the crew shall stand in need of in case of sickness, at every port or place where the ship or vessel may touch or trade at during the voyage, without any deduction from the wages of such sick seamen or mariner."

Early in the session of Congress, in November, 1804, Dr. Mitchill solicited the attention of the national legislature to this interesting object. He observed, that the present provision, by the existing statute, was extremely defective, for that by applying only to vessels of *one hundred and fifty* tons and more, and navigated by *ten* men or upwards, the greater part of the traders to the West-Indies being either under that tonnage, or manned with fewer people, were left destitute of medicine-chests. He thought this was an omission that deserved an immediate remedy; for as the provision now stood, that part of our navigation which stood most in need of medicines on board, at sea, and in foreign ports, was almost wholly destitute of them. He stated, that about one-sixth of the men shipped were ordinarily not well, or fit for service when they signed the articles. Their diseases frequently broke out on the voyage, and when to these were added common accidents, and the pestilential exhalations extracted below the deck from beef, pork, fish, hides, and other perishable substance in as hot cli-

mate, that, on the average of voyages, one-tenth of the crew was cut off; and a proportional sickness raged among the survivors. He hoped, therefore, that the benefit of medicine-chests might be extended to vessels below *one hundred and fifty* tons, and manned with *less than ten* men.

A bill was accordingly passed, extending the provisions, regulations, and penalties of the aforesaid act, as far as relates to a chest of medicines, to all vessels of the burthen of *seventy-five* tons and upwards, and navigated by *six* persons or more in the whole, bound from the United States to any port or place in the West-Indies.

It is to be expected, that the extension of this remedial section of the law, so far as this has been done, will be followed by happy effects to our seamen while on those perilous voyages. When they are at home, there is a support for them from the Hospital-fund, of which we gave a particular account in our Hex. i. vol. vi. p. 209, to which we now beg our readers to turn.

OTHER DISCOVERIES OF SLATE FOR ROOFING.

On a former occasion we mentioned that quarries of slate for covering houses, had been opened near the banks of the Hudson, in New-York (Med. Rep. vol. vi. p. 342) The same material has been since found to be good and plentiful in Pennsylvania, near the Susquehanna, whence it has been carried down to the places on the Chesapeake. And a quarry has been opened near Fredericktown, in Maryland, which affords a great supply of excellent slate. Both, it is said, are found very well adapted to the covering of houses.

ELEGANT AND INSTRUCTIVE COLLECTIONS OF MINERALS.

By the aid of chemistry, so much light has been shed upon the composition of fossil bodies, that the department of mineralogy has become very extensive and well explored. The researches of travellers and artists, in various parts of the world, have been remarkably successful in detecting and amassing specimens. And cabinets, stored with the various earths, ores, metals, and petrifications, with which the globe abounds, have, in the present advanced stage of knowledge, become very interesting to the man of taste and business, as well as to the votary of science. We mention, with pleasure, two large and select collections of minerals brought to New-York from Europe. One of these belongs to Benjamin Douglas Perkins, Esq. and, to rich variety, unites an orderly and methodical dis-

tribution. The other is the cabinet of Archibald Bruce, M. D. and is a precious assortment of mineral specimens systematically disposed. In both are contained the chief part of the new metals and other late discoveries of the chemists. The introduction of such various and costly museums is very honourable to their proprietors, and great advantage may be expected to accrue therefrom to the country, by disseminating the taste and knowledge of this beautiful and useful branch of natural history. Newport, in Rhode-Island, has for a considerable time enjoyed the benefit of the collection made by Mr. Gibbs during his European tour. A valuable European collection was lost by the untimely death of Thomas P. Smith, Esq. of Philadelphia.

**EXPEDITION TO EXPLORE THAT PART OF LOUISIANA
WHICH LIES NEAR THE OUACHITA RIVER.**

Pursuant to the provision made by Congress, as related in our Hex. ii. vol. i. p. 407—9, Mr. Jefferson authorized an expedition as early as he could in 1804. William Dunbar, Esq. of Natchez, and Dr. Hunter, of Philadelphia, were engaged to undertake this service. It was the original intention to have directed them to explore the countries washed by the Arkansas and Red Rivers, as expressed in the resolution of Congress. But, it having been discovered that the Spanish Americans and Indians were hostile to the project, and might have been expected to make forcible opposition to it, the design of exploring them was deferred until a future day. But this by no means frustrated the whole business; on the contrary, the President instructed the gentlemen to proceed up the Ouachita River, and examine the country through which it passed, as far as the Hot Springs. These are situated in lat. $34^{\circ} 31'$ north. This river runs, for some distance, almost parallel with the Mississippi, and as high as the post of the Ouachita, in lat. $32^{\circ} 30'$, is not more than twenty-five miles distant from it. Above that it takes a turn, and its course is nearly parallel with that of the Arkansas.

Mr. Dunbar and Dr. Hunter returned in Feb. 1805, from their expedition of five hundred miles up the Ouachita. Their report will be addressed to the President of the United States. They have taken courses and distances all the way. They have made astronomical observations to ascertain the latitude and longitude of various places. Mr. D. relates, that the Hot Springs are numerous; that their heat raises the thermometer to 130° and even to 150° . The water contains lime, iron,

and free carbonic acid, and is very agreeable to the taste, both hot and cold. In the waters of 130°, both vegetable and animal life was sustained; for he saw a species of conferva growing, and a microscopical testaceous bivalve crawling. The safe return of these gentlemen is an agreeable event; and their report, which will be communicated to Congress at the ensuing session, will, without doubt, be agreeable to all classes of citizens.

ROUTE FROM WASHINGTON TO ORLEANS.

By the geographical and astronomical labours of Mr. Isaac Briggs, a route has been delineated for the transportation of the mail, and for public dispatches, between the seat of national government, in Maryland, and Orleans, the capital of Lower Louisiana. This is proposed to be done on the east side of the mountains; and, from the map of survey, it appears, that the travelling road may be carried on or near a straight line, without interfering with the great chains and ridges. These will be left to the westward. Mr. Briggs encountered almost intolerable hardships in traversing the wilderness between the high shoals of Apalachy and Orleans. The following extracts from his letters to Mr. Jefferson will give an idea of his sufferings. On the 2d of October, 1804, he wrote thus from Hawkins's settlement, two miles south of Tallapoosa river:

"On the 2d ult. I wrote to thee from Clarksborough, in Georgia; from whence we proceeded to Gen. Meriwether's for information; whose kindness merits our warmest acknowledgments, in furnishing us with much useful information, a pack horse, and provisions for our journey, as far as Col. Hawkins's on Flint river. These preparations necessarily delayed us four days. On the 6th we departed from Gen. Meriwether's, and after wandering many miles astray in the wilderness, we arrived, on the 8th, at the store of an Indian trader, about thirty-one miles from Gen. Meriwether's. Here we were delayed two days by severe and stormy weather; sometimes the ear could scarcely distinguish an interval between the sound of one falling tree and that of another. Having made many fruitless efforts to procure a guide to Col. Hawkins's, on the 10th we proceeded without one. From thence to Col. Hawkins's (a distance of about sixty miles) we travelled, or rather wandered, at least one hundred and twelve miles, frequently climbing over precipices, wandering through swamps, and crossing deep and difficult water courses; many miles without a path, our horses greatly incommoded and fatigued by sensitive briars and

other vines. Our provisions were soon wet and spoiled, and we were in danger of starving, not having seen a human face except each other's, for more than four days. On the 15th we arrived at Colonel Hawkins's, on Flint river.

"From Colonel Hawkins we received the most polite and friendly treatment, and every assistance in his power. He informed us, that had we made the attempt sooner in the season, it would have been impossible for us to have passed through, for the scarcity of provisions has been such, that the nation has been almost in a state of famine—and that the large horse flies would have destroyed our horses, having actually killed many.

"The Colonel having furnished us with a pack horse, provisions, and a guide, on the 20th we proceeded, and on the 27th we arrived here (one hundred and twenty miles), after a journey the most laborious, both to ourselves and our horses. There having fallen a very heavy rain after we left Flint river, we found the rivers, creeks, and low ground so full of water, so rapid, and so entangled with vines, as to threaten almost a certainty of drowning our horses, if not ourselves, should we attempt to cross before the waters had subsided, so that we could see by the bushes the course of the path. Our horses swam the Chatahouchy river from shore to shore, and six creeks between that and this place. In short, we arrived here much fatigued.

"I had an idea that I could pass through this country without a path or a guide; but when I mentioned it on the frontiers of Georgia, it was scouted and laughed at, and I am now firmly of opinion that, in this way, it would be at least a *four months'* passage from Georgia to New-Orleans."

In another letter from Orleans, dated the 26th of November, he has these remarks:—"On the 29th ult. we left Tombigbee, passing through the town of Mobile, we crossed Pascagoula river near its mouth, passed round the bays of Biloxi and St. Louis, to Pearl river, about ten miles above its mouth: from thence we passed down Pearl river, through the Rigolets and Lake to New-Orleans. On this part of our route, (a distance of about two hundred miles) we were twenty-five days. To give some idea of the difficulties we have encountered, besides the insurmountable delays of transporting our horses over rivers, several miles wide, where there are no ferries, I will mention the progress we made in one fatiguing, industrious, and laborious day's travelling, when entangled among impassable boggy drains, which are very frequent, and of considerable length, we encamped at night about three miles from

our encampment on the preceding night. Yet these obstacles might be easily overcome by a little labour, and a road, in my opinion, may be made on the route which we have contemplated, with much less expense, and far superior to the best gravelled turnpike in the middle States. The practicable distance from the city of Washington to this place, will be very little more than a thousand miles."

Mr. Briggs computes the distance in *air-measure* to be nine hundred and eighty miles, and, considering the uncommon evenness of the surface, he supposes the actual *land-measure* will not exceed one thousand and twenty-nine miles. Fredericksburg, Cartersville, and Danville, in Virginia; Salisbury, in North-Carolina; Athens, in Georgia; Point Comfort, on the Tallapoosa river (Creek Nation); and Mobile river, just below the confluence of the Alabama and Tombigbee, are some of the principal points touched in the proposed route.*

PLACE WHERE THE ORE OF COLUMBIUM WAS FOUND.

It has been ascertained, that the specimen of this metal, upon which the experiments were made, as mentioned in our *Med. Rep. Hex. i. vol. vi. p. 322*, was taken from a spring of water in the town of New-London, in the State of Connecticut. The fountain is near the house in which Governor Winthrop used to live, and is about three miles distant from the margin of salt water, at the head of the harbour. This is the spot heretofore called Nautneague; which is in Connecticut, and not in Massachusetts. By the politeness of Francis B. Winthrop, Esq. of New-York, the manuscript papers of his ancestor, relative to this place, and to the minerals he carried to Hans Sloane, have been sent to the Historical Society of Massachusetts. By their care, we hope, every interesting particular concerning this substance, and the place where it was originally found, will be made known to the public. It will then be easy for gentlemen to visit the spot, and to collect other specimens of this singular ore.

Useful Communications and Labours of ROBERT R. LIVINGSTON, *late Minister Plenipotentiary of the United States at Paris.*

The skin of the fur-seal is eagerly sought after by our navigators, who make voyages to the north-western parts of Ame-

* The latitudes, longitudes, bearings, and distances of these places were communicated to Congress by Mr. Jefferson, in a message, dated 23d of February, 1805, where the curious inquirer may find them.

rica, and to the islands described in our present volume, p. 76. A specimen of cloth made in England from the fur of this animal, has been transmitted to Dr. Mitchill, by Robert R. Livingston, Esq. late Minister of the United States at Paris, to whom it had been presented by Sir Joseph Banks, President of the Royal Society of London. This sample of cloth, manufactured of seal-fur, was accompanied by a piece of the skin, with its natural double covering of fur and coarse hair, and another from which the coarse hair had been pulled out, and the thick and downy fur left behind adhering to the pelt. Mr. Livingston has made this communication to his countrymen, that they may be informed of the processes performed upon the skin and fur of this animal in Europe, and be thereby enabled to turn them to some valuable account at home.

In the 6th volume of our *Hex. i.* vol. i. p. 315, we inserted an article of intelligence concerning the conversion of pyrites into manure, as observed by Mr. L. during a journey he made through the Netherlands. He has, since that time, forwarded parcels of the materials employed to make the fine French porcelain in the manufactory of Seve, that his fellow citizens at home might have them as standards of comparison to judge the better whether their own country produces the like.

This distinguished and public-spirited gentleman, after having accomplished the purchase, and witnessed the cession of Louisiana, has solicited a recal. His request having been complied with on the part of the government, Mr. L. has determined, before he sails for America, to visit Germany and Italy. From the taste which he is well known to possess for agricultural, economical, and manufacturing operations, from his ample fortune and lively patriotism, it is expected that he will bring home much useful and practical knowledge on such subjects. Indeed, he has some time ago made a beginning, by sending hither several ploughs and other implements of husbandry, constructed upon the most approved models in England.

Such a traveller will examine every country that he visits with a curious and inquiring eye, and will, doubtless, in each, collect something which may prove beneficial to his own.

SURVEY OF LONG-ISLAND SOUND.

The congress, desirous of giving all possible facility and aid to navigation on our coasts, did, by an act passed in 1803, authorize a survey to be made of that important arm of the sea, which lies between Long-Island and the continent. Ac-

cordingly, that service has been performed pursuant to a direction of the Treasury Department, under the superintendence of the Collector of the Port of New-York. The three commissioners appointed to execute this business have made a chart of this great thoroughfare of coasting trade from Throg's-Point to Fisher's-Island, including the shores on both sides of the sound, and the principal islands, reefs, and shoals which lie between. Copies of this are deposited in the office of the Secretary of the Treasury, at Washington, and of the Collector of the Customs, at New-York.

Boundaries of the Lands ceded to the Nation by the Natives of the North-west, in the Treaty of St. Louis, November 3, 1804.

The Sacs and Renards have conveyed to the United States a tract of upwards of fifty-two millions of acres, situated on both sides of the Mississippi, and lying within the following limits: beginning at a point on the Missouri river, opposite to the mouth of the Gasconade river, thence in a direct course so as to strike the river Jeffreon at the distance of thirty miles from its mouth, and down the said Jeffreon to the Mississippi; thence up the Mississippi to the mouth of the Ouisconsin river, to a point which shall be thirty-six miles in a direct line from the mouth of the said river; thence by a direct line to a point where the Fox river (a branch of the Illinois) leaves the small lake called Sakaegan; thence down the Fox river to the Illinois river, and down the same to the Mississippi. The consideration is an annuity of one thousand dollars yearly, six hundred of which is for the former, and four hundred for the latter tribe.

MORE GOLD PICKED UP IN NORTH-CAROLINA.

By turning to our Hexade ii. vol. i. p. 307, our readers will find an account of the discovery of an uncommonly large lump of native gold, and many small masses of the same metal, in Meadow creek. It since appears from a report of the director of the mint, that about eleven thousand dollars of the gold coin which issued from the mint during the year 1804, was formed of this native gold of Cabarrus county. Besides the quantity formerly mentioned in Med. Rep. and deposited in the mint, several pieces of four and five pounds weight have been found, and also many more in the size of small grains. It is expected these will be forwarded to the mint for coinage. The gold heretofore sent there had been formed into small ingots,

for the convenience of carriage, by which the director supposes a considerable waste was suffered. As the larger lumps are now chiefly picked up, the people are engaged in washing and searching the sand for smaller particles. And it is said that the quantity procured in this way is very well worth the seeking.

REWARDS FOR RAISING HEMP.

The honourable the trustees for the encouragement of arts, manufactures, and commerce, have signified their approbation of the industry and diligence which have been exercised in the cultivation of hemp in the two Canadas, and have decreed, as an honourable reward and mark of that approbation,

To J. W. Clarke, Esq. Montreal, for the culture of hemp, the gold medal.

To Mr. Jacob Schneider, York, Upper Canada, for the culture of hemp, the gold medal, or one hundred dollars.

To Mr. Daniel Mosher, Kingston, Upper Canada, for the culture of hemp, the silver medal, or eighty dollars.

ANNUAL REPORT OF THE GOVERNORS OF THE NEW-YORK HOSPITAL TO THE LEGISLATURE OF THE STATE.

In our Hexade ii. vol. i. p. 293, was given a summary of the affairs of this Hospital for 1803. The Managers of that excellent Institution have made to the Legislature sitting in Albany, their annual report of what has been done during the year 1804. By this it appears, that during the said term, the number of patients received is 1346. Of these, 835 were discharged cured; 62 were relieved; 42 went out by request; 9 were sent to the poor-house; 30 were dismissed for disorderly conduct; 22 run away; 159 died; and 187 remained in the wards of the house. The patients which were disposed of were natives of the following places, to wit; of Fredish America 575, of British America and other parts of the West-Indies 125, Spanish America and other dominions of Spain 4, Portuguese America and other parts of that kingdom 6, French America and its European possessions 45, Danish America and Europe 9, Africa 15, East-Indies 5, Germany 34, Belgic Netherlands 12, Ireland 257, Italy 7, Malta 1, Prussia 8, Russia 1, Scotland 45, and Sweden 10. We mention, with pleasure, that this institution is liberally patronized by the commonwealth, and that its immediate managers exercise these trusts with great liberality and disinterestedness. As a proof of the generosity both of this corporation and of the State Legislature, more than half the expense of supporting this asylum for the distressed,

has been expended on the natives of foreign countries, and of these 427 were born in the dominions of Great-Britain. So remarkably does our land of plenty allure aliens to take refuge in its hospitable bosom.

EFFECTS OF THE ALKALIES ON POISONS.

New Facts, in Confirmation of the Doctrine maintained by Dr. Mitchill, in Med. Rep. Hex. i. vol. iv. p. 149, 257, and 297, on the Efficacy of Alkalies to overcome Poisons.

The excellence of alkaline salts, as antidotes to the venom of serpents, and the acidity of the poisons secreted by those animals, is evinced by the following information, written January 7, 1805, by Dr. John Brickell, of Savannah, to Dr. Daniel M. Hitchcock, of New-York:—"You have probably seen my publication, of a successful mode of cure on a person bit by a large mockison snake. He was in dreadful torture, and swelled ready to burst. I gave him plenty of ley of ashes with water to drink, and kept the bite which was on his foot constantly wet, by applying a solution of ley, made caustic by quick lime.

"I was led to this by a chemical examination of the poison of *crotalus horridus*, which showed an acid to be one of its constituent parts.

"The mechanical structure of the poison-fangs and bags is alike in each of the above serpents.

"On putting a slip of litmus paper into the mouth of a rattlesnake five feet long, and disabled by blows of a stick applied to the back, and then pressing the head, by placing on it the foot, the poison squirted out to the distance of some feet.

"Some of the poison struck above the eye of the gentleman who performed the operation for me; he wiped it off with his pocket-handkerchief and no harm ensued; some struck on his white-cotton waist-coat, and tinged it of a light yellowish colour, inclining to brown.

"The part of the litmus paper, which I made of a sky blue, had its blue *entirely discharged*, and became white. A light band of red was to be seen between the part of the paper touched and untouched by the poison. Dipping it, when dry, in a solution of fixed alkali (ley) restored the former blue colour.

"We have here, 1st. the *crotalus horridus* of Linnæus. 2d. the *crotalus miliaris* of Linnæus; and four species new to me. One is nearly black, with a chain of white lined rhombi on the back: this I have named *crotalus rhombiferus*; this measured six feet two inches in length, and above $11\frac{1}{2}$ inches round.

"Another has a yellow skin, with zigzag brown belts, six feet long: this I have named *crotalus zetazona*. The 3d and 4th are twelve to fifteen inches long, venomous as the others; one is black, with paler bands down its sides; the other is yellowish, with a chain of rhomboid dark lines on the back, and a brown line round the head above the eyes."

NEW SPECULATIONS ON THE PRINCIPLE OF VITALITY AND
ON THE NATURE AND TREATMENT OF YELLOW FEVER.

Dr. J. LEYMERIE, formerly a resident at Paris, Chief Physician of the South Hospital, and Professor of Medicine and Chemistry in that city, lately arrived at New-York, from Cayenne. Soon after his arrival he communicated, in a public lecture, to a number of gentlemen assembled for the purpose, at the City-Hall, the outlines of a new doctrine of vitality, and of malignant diseases, which seems to be the result of much research, and of a variety of experiments and observations which he had made previously to his departure from Europe, and during his residence at Cayenne. Dr. Leymerie supposes that his discoveries bear a direct and important relation to yellow fever; and it was the application of them to explain the nature, and unfold the treatment of this disease which principally engaged his attention in this lecture.

We are sorry that our limits will only allow us at present to offer the following imperfect sketch of these ingenious speculations.

Dr. Leymerie supposes, that the phenomena of vitality, the *punctum saliens* of HALLER, and the red colour of the blood, are the product of a chemical combination resulting from the union of pure ammoniac (volatile alkali) with a substance of the nature of gelatine. He believes ammoniac to be a constituent part, and the most essential of the constituent parts of the human body. And hence he accounts for the large quantity of it produced by every mode of animal destruction, as by fire or otherwise.

After this account of the constitution of the principle of vitality, it is scarcely necessary to say that he rejects the generally received doctrine of the agency of oxygen in the process of life, and, on the contrary, supposes that substance to be adverse to it. He likewise rejects the opinion, supported by many chemists, that the red colour of the blood is the result of a *phosphorico-ferruginous* combination.

He believes that his doctrine may serve to reconcile the opi-

nions of *Boerhaave*, and many facts stated by *Pringle*, *Macbride*, and *Huxham*, to modern discoveries.

He asserts, that by the mixture of pure ammoniac with milk, in certain adjusted proportions, within a given time, the milk is converted into a fluid, containing all the qualities of the fluids of the human body, and which assumes the colour and appearances of the blood.

He is confident that his doctrine will afford a satisfactory solution of the problem concerning animal heat which divides the opinions of naturalists and physicians; that it will also explain the generation of the animalcule discovered in the pimples of the itch, which has been believed by some to be the primary cause of that disease; that it will account for the origin of lice and of other insects bred on the surface of the human body, or rather under the epidermis; and, finally, that it will serve to explain the production of worms, with all their varieties, especially of the *tenia*.

Dr. Leymerie takes for granted, that the yellow fever consists in a dissolution of the blood and other fluids, a decomposition of their constituent principles, the *maximum* of which decomposition extends not only to the separation of integrant molecules, but also to that of the several elements belonging to the composition.

He concludes, that ammoniac is the most powerful antiseptic and corroborant in the world; that it instantly arrests the process of putridity; and he asserts that the exhibition of it in milk, or in some other similar fluid, when given seasonably and in proper quantity, is preferable to all other remedies in yellow fever.

ICE-ISLANDS IN THE ATLANTIC OCEAN.

Ships from the northward, arriving at New-York and other ports, bring alarming accounts of the fields and mountains of ice floating this spring in the ocean. It is believed that the *field-ice* comes from the river and gulf of St. Lawrence, and the *mountain-ice* from Davis's Straits, Baffin's Bay, and Greenland. Several vessels on their passage from Great-Britain to New-York have been very much endangered by them this season; and it is remarked that they appear much earlier than is usual. On the 6th of April, 1805, the ship *Jupiter*, Capt. Law, of New-York, was entangled amidst innumerable broken pieces, large floating islands, and, in some directions, firm continents, as it were, of ice, as far south as lat. 44 deg. 20 min. N. and lon. 49 deg. W. The weather was

foggy and moderate. The ship, after many fruitless endeavours to extricate her, struck a detached mass of ice, and was lost, with twenty-seven of her people. The rest escaped in the boats, and trusted to the waves. Another ship arrived a few days ago at New-York, after having suffered remarkably from the attrition of ice against her side-spars and bottom, and after having been in imminent danger. Two years ago, a British packet, homewards bound from New-York, ran foul of an ice-island, and was lost; though that was considerably later in the season.

Capt. Bennet, of the ship *Oliver Elsworth*, fell in with the ice on April the 7th, in lat. 45 deg. 46 min. and continued to be endangered by it until the 8th, in lat. 42 deg. 50 min. the longitude was 47 deg. W. He was surrounded by thick masses and extensive fields of ice. This was not a solid body, but had been reduced to small fragments by wind and waves. The ship forced her way through it, protecting her bow and bottom as well as she could by putting spars, cables and junk along side. The spars were frequently ground to pieces by the violence of the rubbing. The weather was very thick and foggy, so that they could not see twice the length of the ship. After experiencing the greatest danger, the ship at last got through safe, and arrived at New-York. Many other vessels were entangled, some of which were lost..

It is very singular that after the uncommonly rigorous winter of 1804-5, throughout all the states, the ice from the arctic shores should be detached so much sooner than usual, and be drifted in such uncommon quantities to the southern latitudes. A correct history of these large and dangerous bodies of congealed water would be an important addition to our knowledge; and while it threw light upon this branch of physical science, would, at the same time, subserve the interests of commerce and navigation.

FURTHER OBSERVATIONS ON THE FORMATION OF VISIBLE
VAPOUR DURING EXTREME COLD WEATHER.

The production of visible watery vapour seems to depend upon the relative, and not the absolute heats of bodies. In the 4th volume of the first Hexade of our work, the reader may find, at page 309—312, a recital of some experiments made to ascertain the difference of temperatures necessary to produce visible exhalation. The experiments there related were made when at New-York, the atmosphere was rapidly cooled much below the heat of the subjacent earth and water.

The same phenomenon will occur when the atmosphere suddenly becomes warm, while the surfaces of the earth and rivers remain greatly refrigerated. A remarkable instance of fog or mist, on such an alteration of weather, from extremely cold to moderately warm, happened during the remarkably severe winter of 1804-5, which was more rigorous than any that had been experienced since 1779-80.

During the month of January, the quicksilver had descended in the tube of Fahrenheit's thermometer, suspended in the open air, to 18, 11, 7, and even to 3 above cypher. The snow and ice on the surface of the earth and rivers were still colder. On the morning and evening of the 22d, the mercury had been 7° above zero, at the height of ten feet and more from the ground. On the morning of the 22d, it had risen to 11°, and on the morning of the 24th, it had gradually got up to 30°. It continued ascending, so that it had reached to 43° that evening, and by the hour of sun-rising on the 25th, had mounted to the 46°; at noon it was up to 54°; and at ten in the evening was no lower than 36°. These facts were ascertained by the observations of Dr. Cutler on the Capitol Hill, and Dr. Worthington at Georgetown.

In this case the atmosphere rapidly grew warm, while the snow on the land and the ice on the water were intensely cold. The difference between the temperatures of the air and of the frozen surface of the earth and water was twenty degrees, and for a part of the time considerably more. In consequence of this disproportion of the heats on the congealed surface, and in the incumbent atmosphere, there was a great quantity of watery vapour produced, the particulars of which, as they occurred at Washington, near the bank of the Potomac, in Maryland, were thus noted at the time by Dr. Mitchill: "At break of day, on the 24th of January, when I left my bed, there was a little misty vapour to be seen. As the sun rose, and the air became warmer, it increased, and continued all the day in the form of a thick mist or fog. This more particularly overhung the snow and ice, and was much less perceptible where the ground was bare. It was wafted about in thick clouds. It completely concealed from view the Tiber and Potomac, then both covered with ice and snow. A dense white cloud was all that could be seen, and as it overspread the rivers, intercepted completely the view of the Virginia shore. The top of the President's house, and the summits of many tall trees could be seen emerging from the mist which enveloped their lower parts. This fog continued until bed-time. Be-

fore, and during the morning of the 26th, the warmth of the air had abated, so as to freeze the water in puddles along the roads, or, in other words, the mercury had descended to 32° and lower. In consequence of this approximation of temperatures in the atmosphere, and on the earth's surface, the vapour had chiefly vanished before morning. However, toward mid-day, the quicksilver got up to 44° , and some appearance of haze in the atmosphere was the consequence. Soon after noon, there was a shower of rain, and between 3 and 4 P. M. there was a flurry of snow. Indeed, so remarkably were the temperatures adapted to each other at that time, that at Georgetown (Maryland) mist, snow, and rain were all formed together, and falling at the same moment."

PROJECTS FOR FRAMING GOVERNMENTS AND BUILDING CITIES.

Among the speculative men who have offered opinions to the public on these interesting subjects, there is a native of Bienne, in Switzerland, who seems not to be generally known. His name is JEAN-JACQUES MOLL. He has written a work on the means of rendering a democratic republic the most happy and agreeable state that exists, without violating the principles and foundations of the most perfect equality. In it he distributes the people into four classes, of notables, tribunes, plebeians, and patricians. The title of his treatise is, *Moyens de faire d'une republique democratique, sans porter atteinte aux principes et bases de la plus parfaite egalité, l'etat le plus heureux et le plus agreable qui existe*. The constitution of government is detailed at great length. As such a political society might be supposed to want a metropolis, Mr. Moll has also executed a plan which looks very elegant, indeed superb, on paper, of a city large enough to hold one hundred thousand inhabitants. This design is highly finished and coloured, and accompanied by an explanatory pamphlet, under the title of, *Plan d'une ville de cent mille hommes, &c.* In this the author explains the general and particular nature of each object, its utility, beauty, conveniences, advantages, and more especially the mode of carrying the project into operation in a short time, without its requiring any advance of money, or being of any expense to the state, although undertaken and carried on at the charge of government.

In the abundance of his industry and zeal for manufacturing governments and towns, he submitted his plans to the ruling power of France in 1801; where it appears the author had

the satisfaction and reward of being honourably mentioned on the minutes.

Since that time he has sent copies of his performance to the Senate of the United States. Thinking, probably, that Louisiana and our new territories would want forms of government and plans of cities, Mr. Moll has sent over samples of both. They arrived during the year 1804. They resemble most other utopian schemes of the kind, and we notice them as splendid visions.—We have much better constitutions and towns ready made.

ADDITIONAL MEDICAL INTELLIGENCE FROM THE MEDITERRANEAN.

After our account of the yellow fever at Leghorn, Malaga, &c. had been committed to the press, we had the pleasure of receiving further and more particular information on that subject from our excellent correspondent Dr. Valentin, who has recently established himself in the city of Marseilles. That gentleman is already well known to our readers by important communications heretofore inserted in this work; and we are glad to find him still zealous, as ever, to promote medical science, and in no degree disposed to remit the ardour and perseverance of his learned labours.

With a letter to Dr. Miller; Dr. Valentin has transmitted a copy of his valuable publication on the yellow fever, entitled "*Traité de la Fièvre Jaune d'Amerique.*" In this work Dr. V. exhibits the results of much diligent research into the origin and causes of yellow fever, both as it appears on land, and on board of vessels, and into its analogies with other diseases; he examines, on the ground of facts and experiment, the question of its contagiousness; and he not only points out the mode of treatment, but likewise suggests the means of preventing the disease, which may be properly used by soldiers and seamen who go to the West or East Indies, or Africa. It would give us great pleasure to see this excellent pamphlet, which was published in 1803, and extends to 247 pages, placed within reach of all the physicians of the United States, by means of a translation.

Dr. V. has also kindly transmitted another French work on the yellow fever, by Dr. Deveze, published since his own; and has accompanied these by other documents and publications, which indicate the present state of medical science and general literature in France.

In his letter, Dr. V. mentions, that the recent prevalence of

the yellow fever in Italy and Spain has excited the strongest sensation throughout the continent of Europe. The government of France has appointed six of the physicians of Paris to go into Spain in the beginning of the ensuing summer, for the purpose of observing the nature, source, and character of that disease. These physicians are directed to inquire and devise the best means of preventing the future returns of an epidemic, which has already depopulated a considerable portion of the kingdom of Spain. Dr. V. had some intentions himself of undertaking this journey into Spain, for the purpose of making observations and inquiries on this subject. We trust he has not relinquished this design; for we are confident the public have much to expect from the accuracy and penetration of so enlightened an observer.

Dr. V. gives the following account of the ravages of the yellow fever in Spain. Malaga, which contained a population of one hundred and ten thousand, lost twenty-six thousand by this pestilence. On the authority of one of the most respectable characters in Spain, he presents the following list of the cities and towns which principally suffered from this epidemic, viz. Malaga and its environs, Antequera, Velez-Malaga, Montilla, Luzeria, Ecija, Cordova, Estera, Espejo, La Remble, Cadiz, Arcos, Carthagera, Alicant, Almeria, Neva, and a number of villages. At Carthagera, fourteen thousand died, although the population of that city did not exceed thirty-one or thirty-two thousand.

By another channel (see London Monthly Magazine for February, 1805, page 72,) we receive the intelligence contained in a letter, dated the 20th of last December, which gives a melancholy account of the state of that unfortunate country. It says, that the annual census having lately been made of the population of Spain, it has been found, that during the last twelve months, it has been diminished one million, which is attributed to epidemic disorders, earthquakes, and famine. In the town of Malaga alone 26,000 persons were buried in the course of four weeks. At Carthagera, the returns of deaths, from the malignant fever, amounted to 14,940. The returns which had been received at Madrid, from various towns, amounted to 124,200 persons who have died of the epidemic malady.

Gibraltar appears to have suffered from yellow fever more than any town in Spain, according to the proportion of inhabitants. In the *Medical and Physical Journal* of London, for March, 1805, we find the following particulars stated in a

letter from Mr. *Kinning*, Assistant Surgeon of the Royal Artillery, to Dr. *Rollo*, dated Gibraltar, December 8, 1804. "Estimate of the total strength of the garrison on the first of September last, including the military, 12,000; of these, 3000 inhabitants quitted the place shortly after the disease appeared. Since the first of September 5000 died, which will make the average of deaths to be more than one in two, without reckoning the number of the military that have not yet taken the disorder; these I calculate about 800. The tenth regiment have lost only two or three men of those who have been in the East-Indies; and very few indeed of their recruits recover; which evidently shows that the climate has done more for them than medical aid. Those who have had the malignant fever of the West-Indies are also secure from this, as there are but very few, if any exceptions!"

British physicians have sometimes reproached the American government with imbecility, and our physicians with unskillfulness, in permitting the yellow fever to make such ravages in the cities of the United States. But what will be said of incomparably greater ravages in a British garrison, where military law and the authority of medical police are unlimited?

PREPARATION OF NEUTRAL SALTS.

The following Communication from the ingenious Ephraim Briggs, Esq. dated Chatham, March 24th, 1802, contains an interesting Account of the Manufacture of Salts established in the Eastern Parts of Massachusetts.

The making of salt is carried on to very great advantage in this and the neighbouring towns. The common salt by the solar evaporation in summer, and the Glauber salt by the cold in winter.

About the middle of November evaporation ceases, so that very little common salt is made after that time. About Christmas, when the cold becomes intense, (a large quantity of common salt being then in solution in the works) the mineral alkali and the vitriolic acid fall in fine crystals to the bottom, forming the genuine Glauber salt. In the month of April or May, the works, which are covered in the winter, are thrown open, and the saline solution exposed to the sun, which soon evaporates the greater part of the residuum, and the remainder of the common salt crystallizes at the bottom. A bitter water is then left, which has always been thrown away as useless.

On examining this bitter water, a great part of it appears to be vitriolated magnesia, commonly called Epsom salt.

This appears from the *milky* appearance a warm solution of it exhibits when vegetable alkali is added, from magnesia being precipitated, and from its producing sal. Glauber, upon adding to it common salt, and suffering it to crystallize in cold air.

As this bitter water is esteemed of no value, I can, at a small expense, procure almost any quantity of Epsom salt I wish for. But the question is, whether this can be done in America where the price of labour is so high, with advantage to the manufacturer?

By following the directions laid down in the Edinburgh Dispensatory, I produced what I believe to be genuine magnesia, in an aerated state. It was nearly the colour of calomel, and tasteless. But having no proper furnace for burning it, I employed a common culinary oven. This not retaining the heat sufficiently long for calcination, I filled the mouth of it with burning coals, the whole batch soon became yellowish, and imbibed somewhat of a disagreeable taste. Whether the colour and taste were produced by the smoke, by vitriolated tartar precipitated with the magnesia, and which before calcination was imperceptible, or from some other cause, I cannot determine.

Mr. John Pennington, in some essays published by him in Philadelphia, in 1799, gives this receipt for manufacturing Glauber salt from Epsom, which he claims as his own discovery. As you may not possibly have this volume in your library, I take the liberty to transcribe it verbatim.

"Take six and a quarter pounds of pure Epsom salt, and five pounds of the best coarse salt, dissolve them in *four gallons* of boiling water, suffer them to remain in a shallow tub for twenty-four hours, when we obtain *at least nine pounds* of a salt in fine long crystals, which shall have all the properties of Glauber salt." From experiments which I have made, it appears probable, that *four gallons* of water will hold six and a quarter pounds of Epsom salt, and five pounds of common salt in solution for ever, unless it be in some way or other evaporated; and from employing much less water, I have never been able to realize so great a quantity of sal. Glauber as Mr. Pennington did.

I have never as yet seen the result of any experiments made upon sea water on the American coast, to ascertain what quantity of alkali, acids, and earth, it contains. Should you become acquainted with any experiments of this kind, they would afford me much satisfaction, and might assist the citizens of Cape Cod in their calculations.

Questions concerning the natural History of the Herring, in the North Seas of America, proposed by Mr. Noel, of Rouen, in France, who has been for a long Time engaged in compiling the History of that Fish.

Is the Herring a fish which is caught in all the seas of the United States of America?

Is it seen more to the South than near the coasts of North-Carolina?

Is it sure that it is this same fish which is caught in the seas of the north-west of Europe?

Is it found in the seas of America, all the months of the year, or only in some particular seasons?

In the latter case, is the time of the Herring fishery the same on all the coasts of the United States of America?

Is it not to be found, at every month of the year, in the bay of Penobscot, in the Delaware, in the Chesapeake, in the waters which surround Long-Island, and, in general, on other parts of the coast?

Does not the Herring go up some of the American rivers, such as the Delaware, the Susquehanna, the Connecticut, the Potowmac, &c. &c. and how far do they leave the sea when they go up these different rivers?

When these fishes have been some time in fresh water, is it perceived that their flesh is improved, as it is remarked in the Salmon, the Smelt, and the Shad-fish?

What are the most remarkable places in those rivers in which the Herring is caught? Can we not procure at Baltimore, Norfolk, Havre, &c. notes or observations on what has been remarked, and is the most curious for the naturalists to know when the Herrings make their appearance?

Messrs. Fisher and Gilpin were to have published some remarks on the course which the Herrings take in America.

We have in France only the curious Treatise which has been collected in the second volume of the Philosophical Transactions of the Society of the Sciences of Philadelphia. Would it be possible to procure what has been since published?

Has quæstiones harengicas proponit et pro iis quoque responsa desiderat S. B. J. Noel, Vice-Director Scientiarum Academiæ Rothomagensis. Ab quindecim annis, elaborat opus Historiæ Naturalis Harengi, variarumque piscationum hujus piscis, in Septentrionali Oceano. Primus liber publicandus est, circa medium anni sequentis 1805.

In istius operis materiâ et honore, America debet habere partem non indecoram.

15 September, 1804.

NOEL, of Rouen.

MEDICAL THESES.

Dr. Caldwell, of Philadelphia, has lately presented to the public the first volume of a periodical work, entitled "*Medical Theses, selected from among the Inaugural Dissertations published and defended by the Graduates in Medicine of the University of Pennsylvania, and of other Medical Schools in the United States: with an Introduction, Appendix and occasional Notes.*" This publication is to be continued by an annual volume, and will, we are confident, be very acceptable to all who are concerned for the advancement of medical science. In an appendix, Dr. Caldwell delivers an "*Experimental Inquiry, respecting the Vitality of the Blood,*" written by himself, in which we find experiments conceived with great ingenuity, conducted with caution, discrimination and impartiality, and leading to conclusions of great interest to the physiologist and medical practitioner. A more particular account of this Inquiry is intended to be given hereafter. And in the mean time we cannot avoid expressing our hopes that Dr. Caldwell will proceed in the prosecution of his plan, and thereby rescue from oblivion many dissertations which deserve to be read, admired, and preserved among performances of real excellence. We form high expectations of the plan, execution, and success of this publication. The well-earned reputation of Dr. Caldwell affords a satisfactory pledge that he will, in conducting this work, do every thing requisite to make it a solid, useful, and permanent addition to the medical literature of the United States.

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